

Department of Scientific and Industrial Research.

DOMINION OBSERVATORY, WELLINGTON, W. 1,
NEW ZEALAND.

SEISMOLOGICAL REPORTS

FOR

JANUARY, FEBRUARY, MARCH,

1932.

IN this report, where the clock correction is not known, the time of P (or the first phase recorded) is enclosed in brackets.

The reports of the various stations are arranged in order of latitude from North to South, except that of Wellington, which is given first.

For notation see "Modern Seismology," by G. W. Walker; also "Monthly Notices of the Royal Astronomical Society, Geophysical Supplements."

Tables used: "Tables of the Times of Transmission of the P and S waves of Earthquakes," by Harold Jeffreys, 1932.

Observer: R. C. HAYES. Director: C. E. ADAMS, D.Sc., F.R.A.S.



Wellington (Dominion Observatory)

Lat. 41° 17' S : Long. 174° 46' E. Height above M.S.L. = 401.5 ft.

Lithologic Foundation : Greywacke (early Mesozoic or late Palaeozoic)

INSTRUMENTS

Milne-Shaw Seismographs, numbers 13 and 36: magnetic damping.
 Wood-Anderson Short-period Seismograph: magnetic damping.
 Galitzin-Wilip Vertical Seismograph: Photo-galvanometric registration, magnetic damping.



CONSTANTS

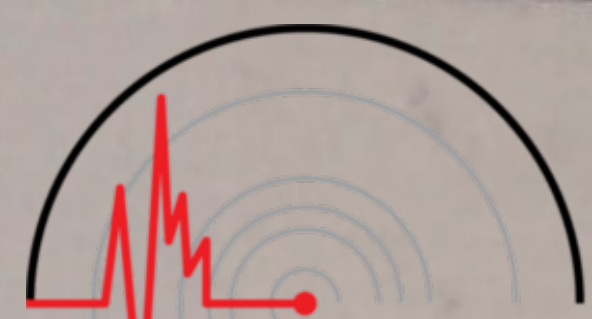
Seismograph and component	Date of Determination	Galvanometer Free period	Pendulum Free period	Damping ratio	$\frac{Ak}{\pi L}$
Milne-Shaw (N)	1931 Oct. 8th.		9.3 sec.	20:1	
Milne-Shaw (E)	1931 Oct. 7th.		9.7 "	20:1	
Wood-Anderson (N)	1931 Oct. 1st.		0.6 "	10:1	
Galitzin-Wilip (Z)	1931 Jun. 22nd.	10.6 sec.	3.60 "	1.72:1	156.5

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 1		2	6			Tremors.	
1	P S	8	27	36 28 33		5.0	
2		0	0			Irregular tremors: felt at Napier	
3	P Pg S Sg M	3	43	41 46 50 57 44 0		0.8 Widely felt in both islands : Maximum R-F 5. Glenmuick $\Delta=2^{\circ}5$ Christchurch $\Delta=3^{\circ}2$ Epicentre :- $40^{\circ}5$ S : $174^{\circ}3$ E. Large amplitudes. Local tremor.	
3	i	6	8			" "	
4	i	3	29			" "	
4	P P* S S* Sg	23	6	42 50 7 3 8 14		1.8 Glenmuick $\Delta=0^{\circ}5$ Epicentre :- $42^{\circ}4$ S : $173^{\circ}0$ E.	
5	i L M	2	12	25 22 23	20	May be S.	
5	S L M	4	45	30 47 5 48	10	18±	
5	P S	18	42	0 21		1.8 R-F 2 at Kahurangi Point.	
6	P	4	5	48			
6	Pg Sg M	4	7	36 40 41		0.3	
6		5	8			Irregular tremors: felt at Thames.	
6	P S	14	26	20 32 0		27.0	



Date. 1952	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 7		17	8			Slight local tremors.	
8	Pg Sg	7	26	30 37		0.5	
8		16	30			Local tremor.	
8	Pg Sg	16	35	0 8		0.6	
9	P PR S SR L	10	28	20 52 15 28 37	20	37.8	Az=NW. Suva Δ=10° ± Riverview Δ=23° 8 Adelaide Δ=27° Melbourne Δ=27° 8 Manila Δ=35° 2 Epicentre :- 10° S : 150° E.
9	Pg Sg M	11	43	28 36 38		0.6	Az=NNW. Felt at Wellington R-F 2 New Plymouth R-F 2, Δ=1° 8 Christchurch Δ=3° 0 Epicentre :- 40° 8 S : 174° 3 E.
9		19	42				Local tremor.
11	P Pg S S	17	58	35 48 0 8		2.2	
12		14	55				Slight local tremor : R-F 2 at Napier.
12		18	8				Distant tremors.
12	L	20	16	12 19	17		
13	L	8	11		20		
13	Pg Sg M	17	15	48 54 55		0.5	
13		19	2				Traces.
14	P S	1	29	6 33 15		23.4	Riverview Δ=22° 1 (?) Approx. Epicentre :- 19° S : 167° E
14	P P ^x S M1 S Sg Ss (?) M2	2	46	47 54 18 21 27 36 44 49		2.7	Felt at Wellington, R-F 3 : at Motu, R-F 2
14	P S M1 S (?) M2	13	16	52 48 50 55 56		4.9	Felt in Gisborne-East Cape region, R-F 3.
15		19	56				Small local tremor.
16		0	16				" " " "
16		0	39				" " " "
16		0	57				" " " " Felt at Glenmuick.

Date, 1952	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 17	Pg Sg	1	39	48 59		0.8	
17		5	12				Tremors: R-F 4 at Wairoa.
17	Pg Sg	7	2	31 29		0.6	
17	P(?) S(?) L	7	51	28 56 38 8 12	17	31.2(?)	Suva $\Delta=18^{\circ}4$, Riverview $\Delta=20^{\circ}9$ Melbourne $\Delta=29^{\circ}5$ Adelaide $\Delta=38^{\circ}7$ Epicentre in vicinity of :- $13^{\circ}S : 160^{\circ}E$.
18	Pg Sg M	11	4	47 55 58		0.6	Felt at Wellington, R-F 2-3, Carterton, R-F 4. Large amplitudes.
18	P S(?)	19	48	57 49 23		2.3(?)	
19		2	47				Small local shock.
20	L	15	10				Slight traces.
21	P P ^x S	14	43	54 59 44 21		2.4	
21	P Pq P ^x Pg Ps S Sg i	21	42	17 26 34 41 52 43 3 16 28		4.1	Az.= NE. Felt at Wairoa and Hastings, R-F 4. Arapuni $\Delta=2^{\circ}1$ Epicentre :- $38^{\circ}3 S : 178^{\circ}3 E$.
22	P S	3	50	12 34		1.9	R-F 4 at Kahurangi Point.
23		13	28				Slight local tremor.
23		23	34				" " " "
24	P PR1 S SR1 L M1 M2	3	49	44 50 17 54 2 56 45 58 4 0 3	6 15 16 17	24.4	Az=NNW. Suva $\Delta=11^{\circ}3$ Riverview $\Delta=23^{\circ}4$ Melbourne $\Delta=27^{\circ}0$ Adelaide $\Delta=30^{\circ}2$ Epicentre :- $17^{\circ}S : 167^{\circ}E$.
24		19	52				Small local tremor.
25	P S M	1	58	58 \pm 2 2 30 8		19.5(?)	Suva $\Delta=15^{\circ}8$, Riverview $\Delta=23^{\circ}0$ Epicentre (from Suva and River- -view) :-
25		6	48				Traces.
25	P S(?)	7	14	38 15 17		3.4(?)	R-F 2-3 at Greymouth.
25	e L	8	0	35 3	13		
25		22	50				Local tremor.
26		0	52				" " R-F 4 at Kahurangi I



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Date. 1952	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 26	eL	5	5		10		
26		14	31				Traces.
29	P PR1 i S L M1 M2 M3 M4 W1 M W2(?)	13	48	44	8	37.1	Az=NNW. Suva $\Delta=25^{\circ} \pm$ Riverview $\Delta=27^{\circ} 1$ Melbourne $\Delta=30^{\circ} 6$ Epicentre :- $8^{\circ} S : 154^{\circ} E$. Large amplitudes.
			50	5			
				55			
			54	33			
			57	42			
			58		28		
		14	3		20		
			5		15		
			9		14		
		15	55				
		16	2				
		19	16				
29		21	23				Local tremor.
30	P PR1 S SR1 L(?) M	3	12	12	15	37.6	Az=NNW Riverview $\Delta=27^{\circ} 7$ Epicentre in vicinity of :- $8^{\circ} S : 154^{\circ} E$.
			13	42			
			18	4			
			21	2			
			23				
			27				
30	Pg Sg	10	42	46		0.7	
				55			
30		21	43				Traces.
30	P S(?)	23	58	50		2.3(?)	
			59	27			
31	L	1	39				
31	L	4	55				
31	P S(?) M	16	8	40		63.6(?)	
			17	14			
			29				
Feb. 1		4	49				Tremors.
2		7	4				Local tremor.
2		7	8				" " "
2	L	7	13				Traces.
3	S(?) L	6	45	40		110(?)	
			7	12			
3	P S L M	11	50	52	15	21.2	
		12	3	42			
			7				
			8				
4	Pg Sg	1	42	18		0.7	
				28			
4	e L	7	30				Tremors.
			36				
6		3	20				Local tremor.
7		11	31				Small local tremor.
7	Pg Sg	21	58	45		0.7	
				55			





Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Feb. 8	Pg Sg	8	58	30 47		1.5	R-F 3 at Dannevirke.
9	P S	5	58	55 59 16		1.8	R-F 3 at Dannevirke.
9		16	11				Prolonged local tremors: R-F 4-5 at Wairoa.
11		23	38				Local tremor.
14		1	50				Traces.
14	P S L M	11	57	38 12 3 22 8 10	16	36.3	
15		0	0				Traces.
16	Pg Sg M	1	51	10 18 18		0.4	Felt at Otaki and Wellington, R-F 3. Large amplitudes.
16	P PR S SR L M1 M2	13	54	24 55 10 59 10 57 14 1 6 8	5 10 25 14 10	27.8	Az=NNW. Suva Δ=2°2± Melbourne Δ=37°7 Adelaide Δ=40°0 Epicentre :- 14° S : 177° E. Large amplitudes.
17		8	45				Traces.
21	i	11	40	56			Strong microseisms.
23	i PR S L M	0	26	5 30 5 35 55 53 1 1	6 18	77.3(?)	May be P. Strong microseisms.
23	L	20	27		13		
24		14	24				Tremors.
24		15	20				"
26		15	19				Local tremor.
26		17	46				" "
26	Pg Sg	22	51	41 48		0.5	
27		0	37				Tremors.
27	Pg Sg	23	24	9 17		0.6	
29		8	53				Small local tremor.
29		22	3				Local tremor.
Mar. 1		2	13				" "

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Mar. 2	P i Pq Pg S M1 i Sg i M2	28	25	17 18 23 31 42 47 47 56 57 26 3		2.2	Felt at Stratford, and in the north-west portion of the South Island: Maximum R-F 6. Glenmuick $\Delta=1^{\circ}2$ Christchurch $\Delta=1^{\circ}5$ Takaka $\Delta=1^{\circ}75$ Seatoun $\Delta=1^{\circ}9$ Epicentre :- $42^{\circ}3$ S : 172° E.
3	P S M S [*] Sg(?)	23	0	32 56 1 2 6 12		2.1	Felt in north-west portion of South Island: Maximum R-F 6. Glenmuick $\Delta=1^{\circ}2$, Takaka $\Delta=1^{\circ}31$ Christchurch $\Delta=1^{\circ}7$ Seatoun $\Delta=2^{\circ}0$ Epicentre :- $41^{\circ}9$ S : 172° E.
4	P S	7	23	0 28		2.5	Felt at Murchison, R-F 4. Christchurch $\Delta=1^{\circ}8$. Epicentre in vicinity of :- 42° S : $171^{\circ}5$ E
4	P S	8	22	22 49		2.4	Felt at Murchison, R-F 5.
5	P i i P ^x S S ^x Sg	1	42	24 42 43 0 10 39 44 9 32		6.6	Az=NE. Felt at Auckland, Hamilton, and around Bay of Plenty, Maximum R-F 6-7 at Whitiangi, Coromandel Peninsula. Arapuni $\Delta=2^{\circ}5$, Christchurch $\Delta=9^{\circ}4$, Epicentre in vicinity of 36° S : 179° E.
5		3	52				Prolonged tremors: felt at Thames, R-F 3.
6	Pg Sg	11	25	18 32		1.0	
7		7	25				Slight local tremor.
8	P S	2	32	32 34 34		10.9	
8	L	3	30		16		Traces.
8		4	37				Slight local tremors.
8		15	24				" " " "
8	P PR S SR L M	18	6	20 7 6 10 33 11 50 14 18	.4 10 15 14	23.8	Az=NE(?) Felt in Fiji. Riverview $\Delta=29^{\circ}8$ Melbourne $\Delta=35^{\circ}0$ Epicentre :- 18° S : 175° E.
9		14	8				Slight local tremor.
10	Pg Sg	4	36	26 32		0.4	Felt at Wellington, R-F 2.
10	i i L M1 M2 M3	5	30	17 45 50 38 41 46	10 10 10		
11	P S M	2	29	46 30 2 3		1.4	At 2h, detonations were heard at the Observatory, but no shock was felt.

Date. 1952	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Mar. 11		4	57			Small local tremor.	
11	P S M	5	18	28 44 46	1.4	Seatoun $\Delta=1^{\circ}6$ Christchurch $\Delta=1^{\circ}7$ Epicentre in vicinity of :- 42° S : 173° E.	
11	P S M	5	21	6 22 24	1.4	Az=WSW. Glenmuick $\Delta=1^{\circ}0$ Seatoun $\Delta=1^{\circ}4$. Epicentre :- 42° S : 173° E. Large amplitudes.	
11		12	18			Small local tremor.	
11		16	25			" " " "	
11		17	24			" " " "	
12	P S	23	3	56 4 22	2.3	Felt at Nelson and Reefton, R-F 4. Christchurch $\Delta=2^{\circ}5$. Epicentre in vicinity of :- 41°2 S : 171°7 E.	
13		5	42			Local tremor.	
13		10	59			Small local tremor.	
13		23	0			Traces.	
15	P S	1	50	58 51 20	1.9		
15		3	20			Local tremor.	
15	L	4	50	30 5 1	15		
16		5	33			Tremors.	
16	P(?) S(?) L M	20	44	17 48 24 49 51	23.2(?) 20		
17	P S	8	35	38 36 4	2.3		
17	P S	8	37	36 38 4	2.5	Felt at New Plymouth and Cape Egmont, Maximum R-F 4. New Plymouth $\Delta=2^{\circ}6$ Epicentre :- 40°5 S : 171°6 E	
17		21	13			Local tremor.	
19		7	0			Slight local tremor.	
19	L	11	10	18 30 32	15	Tremors.	
19		23	30			Tremors.	
21	P S	6	36	1 37 54	10.1		
21		19	17			Traces.	
22		21	1			Slight local tremor.	
23		12	39			Prolonged tremors.	
23	P S	15	15	48 16 11	2.0	Felt at Karamea, R-F 4.5. Christchurch $\Delta=3^{\circ}0$ Epicentre :- 40°6 S : 172°2 E.	



Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Mar. 25	Pg Sg	11	11	16 24		0.6	
26	L M	0	43	1 5	18		Felt at Suva, Fiji.
26	P PR S SR L M	10	1	57 4 0 9 35 15 40 20 28	6 8 20 13	54.5	Az=NNW.
29	P S L M	9	19	32 24 13 27 30		27.2	Az=NW. Adelaide $\Delta=28^\circ$ Epicentre :- 16° S : 162° E.
29		13	2				Local tremor.
30	P S	15	9	4 15 5		39.1	
30	L	19	0		15		
31	Pg Sg M	9	30	10 20 22		0.7	Felt around Cook Strait, R-F 3 Seatoun $\Delta=0.7$ New Plymouth $\Delta=1.8$ Christchurch $\Delta=2.8$ Epicentre :- 40.8° S : 174.0° E.



Suva, Fiji

Lat. $18^\circ 9' S$: Long. $178^\circ 26' E$. Height above M.S.L.=10 ft.

INSTRUMENT

Milne Twin-boom Seismograph: undamp'd.

CONSTANTS

Component	Date of determination	Pendulum Period	Magnification
N-S	1932 Feb. 23rd.	10.4 sec.	6
E-W	" " "	7.2	6

OBSERVER: Miss Mune, Telephone Exchange, Suva.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 5	e M	2	18	30			
5	e i	4	48	30 52 0			
6	P Pg S	14	21	58 22 12 27		2.5	
9	S L M	10	27	57 29 33		10 \pm	
11	P Pg S	3	43	51 44 6 24		2.9	

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 11	P Pg S	7	14	33 0 12		3.4	
13	i i M	19 20	52 7	36 42 11			
15		19	0				Tremors.
16	i	0	11	12			Local shock: strong microseisms.
17	e M	5	28	18 31			
17	P S L	7	49	36 52 57 54		18.4	
20	Pg Sg	14	26	12 30		1.3	
22		14					Tremors.
24	P S M	3	47	(42) 48 51		11.3	
25	P S	1	56	6 0 59		15.8	
25	P S M	7	55	54 27 58		2.9	
26		5					Tremors.
29	S i L M	13	47	4 12 24 51		25.1	
30		3	15				Tremors.
31		16	8				"
Feb. 2	P S	7	2	0 18 3		6.9	
11		13	27				Tremors.
12	e	14	4	55			
12		14	31				Tremors.
14		11	56				"
16	P S(?)	13	48	53 18 49		2.2(?)	Large amplitudes: faint records.
20		7	0				Tremors.
21	i	1	32	48			Local shock.
21	i	11	40	18			Prolonged tremors.
21	i	13	0				Local shock.
23	i	20	15	45			Prolonged tremors.

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Feb. 25	i	0	57	15			
27	P S	0	28	39		3.7	
			29	21			
Mar. 3		18	4			Tremors.	
4		12	37			Tremors: microseisms.	
4	i M	21	11	30			
			14	0			
8	iP	18	1	36		Felt at Suva, and in other parts of Fiji. Subsequent phases unreadable owing to faint records. Landslides reported on the Island of Koro, and the lighthouse shifted at Point Alladin.	
10	e i M	5	31				
			41				
			43				
16	i M	5	30	0		Strong microseisms.	
			33				
16	P S L M	20	42	20		12.2	
			44	36			
			46				
			47				
20	P S	14	48	36		2.6	
			49	6			
20	P S L	10	3(33)			39.3	
			9	36			
			15				



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Arapuni

Lat. 38° 5' S : Long. 175° 39' E. Height above M.S.L. = 212 ft.

Lithologic Foundation : Rhyolite tuffs (Pliocene), more than 300 ft. thick, probably on Mesozoic rock.

INSTRUMENT

Milne Seismograph, undamped, E-W component.

CONSTANTS

Pendulum Period = 22 secs. (1932 Feb. 15th.) Magnification = 5.6

OBSERVER : District Engineer, Public Works Department. Arapuni.



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Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 5	P S(?) L	4	39	24 45 20 47		39.8(?)	
6		14	31				Slight tremors.
9	S(?)	10	34	30			
14	Sg(?)	2	47	36			
17	e M	7	55	24 8 0			
21	P Pg S Sg(?)	21	41	45 42 0 9 25		2.1	
24	eP S SR M1 L M2	3	51	(0) 55 0 56 57 58 59		22.4	
25	e M	2	3	30 6			May be S.
26		5	5				Tremors.
28		21	2				"
29	P S SR L M1 M2 M3 W M	13	48	47 54 17 57 20 58 32 59 14 1 3 15 52 57		34.2	
30	S L M	3	17	42 21 23			
30	S	7	25+				
Feb. 14		12	3				Tremors.
16	S SR L	13	58	3 59 14 0			



Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Feb. 23	S(?) L	0	36	36 49			
Mar. 5	P i S Sg i	1	41	24 33 52 16 52		2.5	
8	S L	18	9	40 13			
10	e	5	33	0			
19	L	11	30				
26	P(?) S SR1 L	10	1	9 25 14 30 23		62.1(?)	P very faint.
29		9	18				Tremors.

New Plymouth

Lat. 39° 4' S : Long. 174° 4' E. Height above M.S.L. = 112 ft.

Lithologic Foundation : Ash, agglomerate and lava at least 100 ft thick on argillaceous sandstones and mudstones (Pliocene).

INSTRUMENT

Wood-Anderson Short-period Seismograph, magnetic damping.

OBSERVER : Mr. H. W. Todd, Warder, The Prison, New Plymouth.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 3	P	3	44			In minute mark. Very faint record, no phases visible.	
9	P S	11	43	58 44 23		2.2	
14	P Pg(?) S	2	47	(0) 11 20		1.7	
14		13	16			Tremors: very faint record.	
Feb. 16	P S	1	51	42 52 6		2.1	
Mar. 15	P S	1	50	48 51 4		1.4	
17		4	58			Tremors.	
17		6	37			"	

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Mar. 17	P i i Pg	8	35	2 6 10 15			
17	P i Pg Ps S i Sg	8	37	36 42 51 38 0 6 14 38		2.6	
19	Pg Sg	6	58	54 2		0.6	
19		12	51				Tremors.
23	P S(?)	15	15	59 34		3.1(?)	P very small and masked by strong microseisms.
31	P Pg S	9	30	26 32 47		1.8	



Hastings

Lat. 39° 38' S : Long. 176° 53' E. Height above M.S.L. = 35 ft.
 Foundation: Alluvial sands, silts and gravels (recent Pleistocene)
 at least 500 ft. thick, probably on limestone and sandstone
 (early Pliocene).

INSTRUMENT

Milne-Jaggard Seismograph.

OBSERVER : Mr. Henry deDenne, 304 South Nelson Street, Hastings.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 12	Pg Sg	14	55	(0) 4		0.3	
14	Pg Sg	2	46	(0) 16		1.2	
14	P S	13	16	(0) 31		2.7	
15		4	28				Irregular tremor.
17		19	44				Long tremor.
18		19	49				Irregular tremor.
18		20	16				Long tremor.
19		4	44				" "
20		20	15				Tremor.
21	P Pq Pg Sg(?) i i	21	42	(0) 6 11 19 26 37			

Date. 1952	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 22		4	33			Long tremor.	
22		23	45			" "	
26		20	45			Local shock.	
Feb. 7		11	30			Slight tremor.	
9		4	45			Prolonged tremor.	
10		4	33			Small shock.	
11		23	50			Tremor.	
12		10	2			Small shock.	
19		2	8			Irregular Tremor.	
19		4	59			Local shock.	
21	Pg Sg	10	8	(0) 4		0.2	
22	Pg Sg	8	20	(0) 4		0.3	
28		15	25			Small tremor.	
Mar. 5		10	34			Local tremor.	
8	Pg Sg	4	36	(0) 9		0.7	



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Takaka

Lat. 40° 51' S : Long. 176° 48' E. Height above M.S.L. = 25 ft.

Lithologic Foundation : Alluvial gravels (Pleistocene).



INSTRUMENT

Imamura Strong-motion Seismograph, three components, oil damping.

CONSTANTS

Component	Free Pendulum Period	Damping Ratio	Date of Determination of Damping	Magnification
N	10	10:1	1932 Feb. 20th.	2
E	10	11:1	" " "	2
Z	4	1.35:1	" " "	2

Note: The values for pendulum periods and magnification are those supplied by the makers.

OBSERVER: Mr. W. J. Smith, Postmaster, Takaka.

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 3		3	44			Tremors: recorded on Milne-Jaggard but no phases shown.	
13	P Pg(?)	17	15	(50) 55		Milne-Jaggard.	
14		2	47			Tremors.	
14		13	17				
Feb. 16	L	14					
Mar. 2	P Pq Pg S Sg(?)	22	25	(0) 6 13 20 31	1.75	Minute marks failed.	
2	P S	23	0	(0) 15	1.3(?)	P not clear.	
5	P i Pg Sg	1	42	25 34 43 40 44 52	5.2(?)		
30		11				Sharp local shock: no phases.	
31		9	30			" " " " " "	

Christchurch (Magnetic Observatory)

Lat. 45° 32' S : Long. 172° 37' E. Height above M.S.L. = 25 ft.

Lithologic Foundation : Gravels.

INSTRUMENT

Wood-Anderson Short-period Seismograph, magnetic damping.

OBSERVER : The Director, Magnetic Observatory, Christchurch.



Date. 1952	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 3	P S S ^x Sg(?)	3	44	14 50 9 20		3.2	
6	P	4	6	28			
6	S	4	8	30			Fresh shock: P confused with previous shock.
9	P S	10	28	53 31		35.5	
9	P Pg S S ^x Sg	11	43	58 14 32 44 51		3.0	
14	P(?) S	2	47	28 19		4.5(?)	P uncertain.
14	P S	13	17	29 48		7.0	
16	Pg Sg	0	56	30 43		1.0	
21	Pg Ps S S ^x Sg(?) i i	21	43	39 0 18 30 51 16 41			
Feb. 29		22	4				Local tremor.
Mar. 2	P i Pg(?) S i i	22	25	9 11 20 26 42 49		1.5	
2	P i Pg(?) S Sg i	23	0	27 29 39 46 55 4		1.7	
4	P S	7	22	58 19		1.8	

Date. 1952	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Mar. 4	P(?) S	8	22	1 30		2.55(?)	P very faint.
5	P i P ^x Pg Ps S S ^x Sg	1	43	2 32 43 44 6 25 48 45 2 41		9.4	
7	Pg Sg	7	24	35 50		1.1	
8		2	35				Small shock.
11	P S	5	18	49 19 8		1.7	
11	i	5	21	12			P or Pg. Faint record: other phases not visible.
12	P P ^x Pg S Sg	23	4	2 9 21 30 50		2.5	
23	P S	15	16	5 39		3.0	
31	P S	9	30	43 31 15		2.8	



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SUPPLEMENT

Reports of Private Stations



Seatoun

Lat. $41^{\circ} 19' S$: Long. $174^{\circ} 48' E$. Height above M.S.L. = 10 ft. (approx).

INSTRUMENT : Inverted pendulum.

OBSERVER : Mr. C. J. Westland. F.R.A.S.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Mar. 2	P S	22	23	(0) 23		1.9	Trace amplitude 1.6 mm.
2	P	22	59	(0) 25		2.0	Trace amplitude 1.6 mm.
8		2	27				Not felt. Trace amplitude 1.3 mm There seems to be a small S-P interval, but too small to be certain.
11	P S	5	18	(0) 18		1.6	
11	P S	5	20	(0) 16		1.4	
31	Pg Sg	9	27	(0) 11		0.7	Max. amplitude 2.3 mm.

Glenmuick

Lat. $42^{\circ} 54' S$: Long. $173^{\circ} 7' E$. Height above M.S.L. = 247 ft.

Lithologic Foundation : Gravel, on Tertiary Cretaceous and early Mesozoic rocks.

INSTRUMENT : Inverted Pendulum.

OBSERVERS : Mr. C. J. Westland, F.R.A.S. and Mr. A. S. Westland.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 3	P S M	3	43	(40) 8 12		2.5	Not felt by the observer, and doubtful whether felt locally.
4	Pg Sg	23	10	(0) 8		0.5	Not felt locally.
14		2	47				Small. There is a doubtful P 0.6 sec. before the distinct out break. This distinct outbreak may be S, or it may be the first movement of a quite local shock Felt locally 3 R-F, also report- ed felt at Waiiau.
16	Pg Sg	0	57	(0) 7		0.5	

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jan. 25	e M	7	16	(0) 14		1.0	Reported felt at Hokitika. Distance computed on assumption that the recorded phases are Pg and Sg.
Feb. 26		9	-	-			Felt locally. No S-P interval can be seen. Amplitude 2.0 mm.
Mar. 2	Pg Sg	22	25	(0) 15		1.2	Felt locally, 3 R-F. Trace amplitude 30 mm., then record off paper.
2	Pg Sg	22	59	(0) 16		1.2	Very slight, only rattling of windows. Amplitude 4.0 mm.
4		7	25				No S-P interval can be seen. Amplitudes small.
11	Pg Sg	5	21	(0) 13		1.0	A very small shock recorded a few minutes before this one.

Department of Scientific and Industrial Research,
DOMINION OBSERVATORY, WELLINGTON, W. I,
NEW ZEALAND.



SEISMOLOGICAL REPORTS

FOR
APRIL, MAY, JUNE,
1932.

IN this report, where the clock correction is not known, the time of P (or first phase recorded) is enclosed in a bracket.

The reports of the various stations are arranged in order of latitude from North to South, except that of Wellington, which is given first.

For notation see "Modern Seismology," by G. W. Walker; also "Monthly Notices of the Royal Astronomical Society, Geophysical Supplements."

Tables used: Tables of the Times of Transmission of the P and S waves of Earthquakes," by Harold Jeffreys, 1932.

Observer: R. C. HAYES, Director: C. E. ADAMS, D.Sc., F.R.A.S.

Wellington (Dominion Observatory)

Lat. $41^{\circ} 17' S$: Long. $174^{\circ} 46' E$. Height above M.S.L. = 401.5 ft.

Lithologic Foundation : Greywacke (early Mesozoic or late Palaeozoic).

INSTRUMENTS

Milne-Shaw Seismograph, numbers 13 and 36: magnetic damping.
 Wood-Anderson Short-period Seismograph: magnetic damping.
 Galitzin-Wilip Vertical Seismograph: photo-galvanometric registration,
 magnetic damping.

CONSTANTS

Seismograph and component	Date of Determination	Galvanometer Free period	Pendulum Free period	Damping ratio	Ak πL
Milne-Shaw (N)	1932 Jun. 1st.		9.6 sec	20:1	
Milne-Shaw (E)	" " 6th.		9.8 "	20:1	
Wood-Anderson (N)	1931 Oct. 1st.		0.6 "	10:1	
Galitzin-Wilip(Z)	" Jun. 22nd.	10.6 sec.	3.6 "	1.72:1	156.5



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Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 1	Pg Sg	2	20	47 55		0.6	Felt at Wellington, R-F 1-2, at Paraparamu, R-F 3.
2		0	53				Local tremor.
3	P S	15	46	55 48 24		7.9	
3	P S(?) L M	20	41	50 43 56 45 35 47	15	11.3(?)	Suva $\Delta=15^{\circ}9$: Riverview $\Delta=26^{\circ}5$ Melbourne $\Delta=31^{\circ}8$ Epicentre :- $32^{\circ} S$: $178^{\circ} W$. Confused record.
4		19	24				Local tremor.
6		10	2				Slight tremor: felt at Kahur- angi Point, R-F 4.
6		13	2				Slight tremor.
6		14	34				Local tremor.
7		1	23				Tremor.
7		10	59				Irregular tremors.
7	P S	11	36	57 37 18		1.8	Felt at Takaka, R-F 5-6, $\Delta=0^{\circ}2$ Seatoun $\Delta=1^{\circ}7$: New Plymouth $\Delta=2.5\pm$ Epicentre :- $41^{\circ}1 S$: $172^{\circ}4 E$.
7	P S	15	39	7 25		1.6	Felt in western portion of North Island, Max. R-F 5. New Plymouth $\Delta=1^{\circ}5$ Epicentre :- $39^{\circ}9 S$: $175^{\circ}7 E$. Confused shock.
8	I I L M	11	28	26 12 0 1 2	16		
10	Pg Sg	15	49	43 47		0.3	
10		22	13				Local tremor.
11		0	43				Irregular Tremors.
12	Pg Sg	9	48	32 41		0.7	

Date. 1952	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 13	P S L M	0	0	17		40.1	Riverview $\Delta=25^{\circ}9$: Manila $\Delta=35^{\circ}7$ Epicentre :- $10^{\circ}S$: $147^{\circ}E$.
13		4	30				Traces.
13		15	58				Local tremor.
13		17	2				" "
14	L	6	57	15			
14		8	4				Local tremor.
14		14	19				" "
16	P S	5	4	55		1.8	Christchurch $\Delta=2^{\circ}1$ New Plymouth $\Delta=2^{\circ}55$ Approx. Epicentre :- $41^{\circ}4 S$: $172^{\circ}5$
16	P S	16	20	36		2.4	Felt at Kahurangi Point, R-F 5. New Plymouth $\Delta=2^{\circ}55$. Epicentre :- $40^{\circ}7 S$: $171^{\circ}7 E$.
17	P S	9	44	43		2.3	Az=SW. Felt on west coast of South Island, Max. R-F 5. Takaka $\Delta=0^{\circ}9$, Glenmuick $\Delta=1^{\circ}4$, Christchurch $\Delta=1^{\circ}8$ Seatoun $\Delta=1^{\circ}75$, New Plymouth $\Delta=3^{\circ}25$ Epicentre :- $41^{\circ}8 S$: $171^{\circ}9 E$.
20	L	4	5	50			
20	P S	7	7	8		1.75	
20	P P ^x Pg S S ^x M Sg	9	32	43		2.0	Felt in central parts of South Island, R-F 3. Glenmuick $\Delta=0^{\circ}7$, Christchurch $\Delta=1^{\circ}6$ Takaka $\Delta=1^{\circ}9$. Epicentre in vicinity :- $42^{\circ}3S$: $172^{\circ}2 E$.
20	P P ^x Pg Ps S M S ^x Sg	14	33	40		2.3	Felt in central parts of South Island, R-F 4. Glenmuick $\Delta=0^{\circ}7$, Seatoun $\Delta=1^{\circ}6\pm$ Christchurch $\Delta=1^{\circ}8$, Takaka $\Delta=1^{\circ}9$ Epicentre (Wellington and Christ- church) :- $41^{\circ}9 S$: $171^{\circ}9 E$ Large amplitudes.
21		15	58				Local tremors: Felt at Wairoa, R-F 5.
23	Pg Sg	8	2	7		0.9	
25		4	21				Tremor.
25	e L	7	17	0		15	
28	P S M	3	10	20		2.6	
29		6	50				Traces.
29		13	20				Tremors.

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 29	L	19	0			Traces.	
29	Pg Sg	20	46	38 48		0.7	
30	P S M	5	11	26 47 49		1.8	New Plymouth $\Delta=1^{\circ}6$ Christchurch $\Delta=3^{\circ}4$ Epicentre :- $40^{\circ}2$ S : $172^{\circ}8$ E.
May 1	L L M	4	19	25 23 25	20		
3	L	19	50			Traces.	
4		0	18			Slight tremors: felt at Napier, R-F 3.	
5	P P ^x Pg Ps S S ^x M Sg	8	24	41 51 59 25 6 13 23 26 38	0.5	2.8	Az=NE. Felt over most of North Island: R-F 8 in Hawke's Bay. Arapuni $\Delta=2^{\circ}3$: Seatoun $\Delta=2^{\circ}5$: New Plymouth $\Delta=3^{\circ}0$: Takaka $\Delta=3^{\circ}7$ Glenmuick $\Delta=4^{\circ}7$: Christchurch $\Delta=4^{\circ}8\pm$. Approximate Epicentre :- $39^{\circ}5$ S : $177^{\circ}6$ E. Large amplitudes.
5	P S	8	30	13 46		2.9	Confused with previous shock. Felt at Napier, R-F 3. Hastings $\Delta=0^{\circ}2$, New Plymouth $\Delta=2^{\circ}5$ Epicentre :- $39^{\circ}3$ S : $177^{\circ}5$ E.
5		9	0				Local tremors.
5		9	35				" " "
5	P S Sg M	11	31	41 32 12 40 43		2.7	Felt in Hawke's Bay, Max. R-F 5. Hastings $\Delta=0^{\circ}2+$ New Plymouth $\Delta=2^{\circ}7$ Epicentre :- $39^{\circ}6$ S : $177^{\circ}6$ E.
5		23	33				Local tremor.
8	P S	15	37	14 48		3.0	
13	P P ^x S S ^x Sg	0	52	10 16 30 42 56		1.75	Felt at Culverden, R-F 5. Glenmuick $\Delta=0^{\circ}4+$: New Plymouth $\Delta=3^{\circ}1$ Epicentre in vicinity :- 42° S : 173° E.
13	Pg Sg M	13	35	8 13 16		0.4	Az=SSW(?), Felt in Wellington, R-F 3-4 Seatoun $\Delta=0^{\circ}4$, Takaka $\Delta=1^{\circ}7$, Glenmuick $\Delta=2^{\circ}0$ New Plymouth $\Delta=2^{\circ}55$ Christchurch $\Delta=2^{\circ}55$ Epicentre :- $41^{\circ}5$ S : $174^{\circ}9$ E.
14	L	4	48				
14	L	8	38				Tremors and L waves.
14	P S	10	12	44 13 2		1.6	



Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.	
		h	m	s				
May 14	eP	18	21	15		58.0	Az=WNW.	
	iP			20				
	PR		24	15				
	ScPoS		28	25				
	S		29	20				
	M1			30	10			
	SR1		33	48				
	SR2		35	30				
	M2		36	32	30			
	L		39					
	M3		40		35		Large amplitudes.	
	M4		46		28			
	15	e	8	18				
		L		23				
M			28		10			
15	P	16	31	22		2.0		
	S			45				
18		7	32				Local tremor.	
18		19	7				Tremors.	
21	e	10	24	36		100-110		
	PR(?)		28	15			May be Scrase's pPP.	
	S		34	40				
	L		58	40				
	M	11	0	0	30			
22	P	1	55	7		2.0	Felt at Karamea, R-F 4.	
	S			30			Christchurch $\Delta=2^{\circ}6$	
	M			31			New Plymouth $\Delta=3^{\circ}0$	
22	P	11	34	18		24.0(?)	P very small.	
	S		38	32			Apia $\Delta=6^{\circ}4$, Suva $\Delta=9^{\circ}0$	
	L		40	20			Epicentre :- $19^{\circ}S : 174^{\circ}W$.	
	M1		42	22	15			
	M2		43	51	15			
	M3		46	50	15			
26	P	16	12	58		12.8	Az=NE. Felt at Motu and Wairoa.	
	PR1		13	14			Approx. Epicentre :- $32^{\circ}S : 173^{\circ}W$.	
	S		15	20			This, and the subsequent shock	
	L			54			appear to have occurred almost	
	M		16	8			simultaneously. The epicentres	
26	P	16	13	6		14.3	Very confused by tail of previous	
	i			14			shock.	
	i			58				
	i		14	7				
	S		15	44				
	L(?)		16	42				
	M		17				Large amplitudes.	
	i			41				
26	P	16	20	30		18.3	Confused with previous shocks.	
	S		23	50				
	M		24					
26	P	16	39	0		14.8		
	S		41	44				



Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
May 26	P S	18	38	22 41 12		15.4	
26	P S	21	10	31 18 0		13.4	
26	P S	22	25	10 27 54		14.8	
27	P S	1	33	4 35 38		13.9	
27	P S	5	58	53 6 1 42		15.3	
27		23	47				Local tremor.
28		7	10				" " "
28	Pg Sg	13	1	49 57		0.6	
30		5	34				Slight Local tremor.
30		21	1				" " " "
31		14	37				" " " "
Jun. 3	I PR1 S PS SR1 L M1 M2 M3 M4 M5 M6 M7	10	50	28 55 10 11 1 10 3 25 9 0 22 15 26 33 37 51 53 56 59	20 16 15 17 17 19 15	95	Fairly large amplitudes.
5	L	5	14		12		Traces.
5	P S	7	47	50 48 6		1.4	Felt at Wanganyi, R-F 2-3.
5	L	12	25		14		Traces.
6	L	8	8		11		Traces.
6		9	30				Prolonged tremors.
7	P S M	21	23	18 24 3 8		4.0	Felt in eastern portion of North Island, Max. R-F 5. Arapuni $\Delta=1^{\circ}3'$, Hastings $\Delta=2^{\circ}4'$, New Plymouth $\Delta=3^{\circ}1'$ Christchurch $\Delta=6^{\circ}45'$, Approximate Epicentre :- $38^{\circ}2' S$: $177^{\circ}8' E$. Tremors.
8		2	45				
8		10	30+				Traces.
8		19	0				" "
11	P S M	0	38	15 36 40		1.8	Takaka $\Delta=0^{\circ}1'$, New Plymouth $\Delta=2^{\circ}3'$, Christchurch $\Delta=2^{\circ}3'$. Epicentre :- $40^{\circ}9' S$: $172^{\circ}5' E$.



Date. 1982	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jun. 11	L	17	30			Traces.	
12	L	3	11			"	
12	P S	5	37	44		3.3	
			38	22			
13	P S	20	4	12		1.3	Felt at Wanganui, R-F 2.
				27			
15	P P ^x S Sg M	13	54	12		0.8	Felt on west coast of North Island, Max. R-F 5. New Plymouth Δ=1.3, Approximate Epicentre :- 40.4 S : 174.5 E. Rather large amplitudes.
				15			
				21			
				23			
				26			
16	i	1	41	0			
16		23	51				Local tremors.
17	P Pg Ps S S ^x Sg Ss(?) M	14	38	3		2.2	Az=NE. Felt over most of North Island, R-F 6 in Hawke's Bay. Arapuni Δ=1.75, New Plymouth Δ=1.9 Epicentre :- 39.6 S : 176.6 E. Rather large amplitudes.
				14			
				20			
				28			
				32			
				46			
				56			
		39		6			
18	P S L M1 M2 M3 M4	10	26	8		84.6	Az=NE(?).
			36	36			
			56	22			
		11	6		17		
			14		18		
			30		17		
			35		16		
18	P S	10	41	34		6.9	Superimposed on distant shock.
			42	51			
18	P S	19	59	25		2.4	
				52			
19	Pg Sg	10	34	52		0.7	
			35	1			
20	e L	3	57		11		
		4	0				
20	L M	5	29	33	20		
			32				
20		19	35				Tremors.
21	Pg Sg M	1	54	22		0.4	Felt at Wellington, R-F 2.
				27			
				28			
21	Pg Sg	16	16	45		0.9	Glenmuick Δ=1.0. Epicentre :- 42.0 S : 174.0 E.
				57			
21		21	50				Tremors.
22	P S M	3	45	16		3.4	
				55			
				59			



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Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Jun. 23	PR S L M	15	18	50 55 45 55	20	90	Reported destructive in Mexico
23	e L M	2	16	35 27 29	16		May be S.
23		19	25				Traces.
23	P S M	19	27	25 38 40		1.1	
24	Pg Sg	2	6	2 8		0.3	
25		1	47				Slight local tremor.
26		10	59				" " " "
26	L	20	10				Traces.
26		21	8				Slight local shock.
27	P S	7	32	26 39		1.0	
27		8	15				Slight local shock.
27	P S M	22	23	26 54 18		2.5	Hastings $\Delta=0^{\circ}2$, New Plymouth $\Delta=2^{\circ}5$. Epicentre :- $39^{\circ}7$ S : $177^{\circ}3$ E.
28		0	4				Slight local tremor.
28	Pg Sg M	9	49	9 20 22		0.8	
28		10	37				Slight local tremor.
29		22	12				" " " "



Suva, Fiji

Lat. 18° 9' S : Long. 178° 26' E. Height above M.S.L. = 10 ft.

INSTRUMENT

Milne Twin-boom Seismograph: undamped.

CONSTANTS

Component	Date of determination	Pendulum period	Magnification
N-S	1932 May 21st.	8.7 sec.	6
E-W	" " "	7.8 "	6



OBSERVER : Miss Mune, Telephone Exchange, Suva.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 3	P S	20	43	0		15.9	
8	P S(?) M	11	55	0		14.1 ⁺	
10		12	1				Tremors.
14	e M	14	0				
17	e M	6	45	33			
18	P S M	19	58				
21	P S	20	0			4.2	
25	P S L M	4	3	0		8.9	
25	e M	4	40				
29	P S L M	7	9	33		18.7	
May 1	e M	12	57				
3	e M	15	0				Prolonged tremors.
5	e M	9	42	27			
14	e M	9	45	30			
14		13	19	5			
14		23					
14	P PR1 S L	4	18	0			
20	P S(?)	4	23				
		19	40	30			
		43					
		8	30				Slight tremors: New Zealand Earthquake.
		4	46(25)				
		50					
		8	33				Prolonged tremors.
		13	22(25)			46.0	
		24	20				Very faint records.
		29	10				
		35					
		9	38(27)			8.2(?)	
		40	0				

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
May 21	P PR1 S L	10	25 (25)			80.2	
			29 0				
			35 30				
			55				
22	P S	11	32 (55)			9.0	Faint records: large amplitudes.
			34 34				
26	P	16	13 (30)				Faint records: all phases after P unreadable. Large amplitudes.
26	P	22	23+				
26		1	34				Tremors.
26	i	5	59				
Jun. 3	P S SR1 SR2 L M	10	51 (0)			85.0	
		11	1 30				
			7 20				
			10 0				
			17				
			21				
8		18	47				Tremors.
16		22	50				" "
16	i M	23	17 20 22				
18	P PR1 S SR1 L M	10	26 (50)			88.3	
			30 36				
			37 36				
			43 20				
			53 30				
			58				
22	P S SR1 L M	13	15 30			82.1	
			25 45				
			31 0				
			42 30				
			45				
22		20	15				Tremors.

Arapuni

Lat. 28° 5' S : Long. 175° 39' E. Height above M.S.L. = 212 ft.

Lithologic Foundation : Rhyolite tuffs (Pliocene), more than 300 ft. thick, probably on Mesozoic rock.

INSTRUMENT : Milne Seismograph, E-W component, undamped.

CONSTANTS : Pendulum period (1932 May 16th)=28 sec. Magnification = 5.6

OBSERVER: District Engineer, Public Works Department, Arapuni.

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 8	e M	11	57 40				
			12 0				
12		23	55				Tremors.
14		6	0				Traces.



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Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
May 5	P	8	24	34		2.3	
	P ^x			43			
	S		25	0			
	Sg			17			
	M			17			
14	P	13	21	(0)		59.6	
	PR1		23	35			
	PR2		24	40			
	S		29	10			
	SR1		36	20			
	M1		41	0			
	L		43				Fairly large amplitudes.
	M2		45				
22	S	11	39	34			
	L		42				
26	P	16	12	45		12.4	
	S		15	3			
	L			20			
	M			30			Large amplitudes.
Jun. 3	S	11	1	36			
	SR1		7				
	L		21				
	M		23				Large amplitudes.
7	P	21	22	45		1.3(?)	P very small.
	S		23	0			
17	P	14	37	45		1.75	
	S		38	5			
	Sg			17			
18	S	10	37	0			
	SR1		43	33			
	L		56	30			
	M		58				



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New Plymouth

Lat. 39° 4' S : Long. 174° 4' E. Height above M.S.L. = 112 ft.

Lithologic Foundation : Ash, agglomerate and lava at least 100 ft thick,
on argillaceous sandstones and mudstones (Pliocene).

INSTRUMENT : Wood-Anderson Short-period Seismograph : magnetic damping.

OBSERVER : Mr. H. W. Todd, Warder, The Prison, New Plymouth.



Date. 1938	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 5		15	46				Prolonged irregular tremors.
5	P(?) S	20	41	32 43 32		9.8(?)	Record confused by microseisms.
7	P S	10	59	22 11 0 0		3.3	
7	P(?) S	11	37	10 38		2.5(?)	P faint.
7	P S	15	39	8 25		1.5	
7	P S	21	49+	50 50			P faint.
13		11	19				Tremor.
16	P S	5	5	8 37		2.55	
16	P P ^x S S ^x	16	20	40 47 21 10 18		2.55	
17	P P ^x S S ^x M Sg	9	45	0 11 37 47 51 58		3.25	Large amplitudes.
17	Pg Sg	13	59	32 35		0.2	
30	P S M	5	11	30 48 49		1.6	Large amplitudes.
May 4		0	14				Tremors.
4	Pg Sg	15	25	12 17		0.4	
5	P Pg S Sg	8	24	(0) 20 34 51		3.0	From Milne-Jaggard record; Observer: Mr. C. E. Morshead. Most of Wood-Anderson record lost, owing to failure of electric supply at 8h 24m 22s.

Date. 1952	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		.h	m	s			
May 5	P S	8	50	6 55		2.55	Confused with previous shock.
5		8	53				Tremors.
5	P S	9	55	33 36 4		2.7	
5	P P ^x Pg i S i M Sg	11	51	51 58 7 15 22 26 33 40		2.7	Rather large amplitudes.
5		11	53				Tremors.
5		16	55				"
13	P S	0	52	44 53 19		3.1	
13	P P ^x Pg Ps S S ^x Sg	13	55	37 46 54 36 3 6 18 25		2.55	Large amplitudes.
14	P S L	13	21	10 29 8 39 30		57.7	
15		16	32				Tremors.
22	P S M	1	55	27 56 1 7		3.0	
26	P S	16	12	45 15 10		13.0	
26	P i i i S M	16	12	53 13 32 14 6 29 15 28 44		14.0	Large amplitudes.
26		21	10				Tremors.
26	P S	22	24	58 27 33		14.0	
27		1	32				Confused shock.
27		5	58				Tremors.
30	P S	6	3	22 49		2.4	
June 3	L	10					Distant shock.
7	P S M	21	23	6 41 44		3.1	Rather large amplitudes.

Date. 1938	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
June 10	Pg Sg M	13	15	41 44 45		0.2	
11	P Ps S M	0	38	25 45 51 52		2.3	
15	P P ^x S Sg	13	54	20 24 35 40		1.3	
17	P P ^x S i	14	38	7 13 29 39 4		1.9	
27	P Pg S	22	23	33 46 24 1		2.5	



Hastings

Lat. 39° 38' S : Long. 176° 53' E. Height above M.S.L. = 35 ft.

Lithologic Foundation : Alluvial sands, silts and gravels (recent Pleistocene) at least 500 ft. thick, probably on limestone and sandstone (early Pliocene).

INSTRUMENT : Milne-Jaggard Seismograph.

OBSERVER : Mr. Henry deDenne, 304 South Nelson Street, Hastings.

Date.	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 10	Pg Sg	1	20	(0) 4		0.3	
10	Pg Sg	11	23	(0) 6		0.4	
20		13	59				Irregular tremors.
May 4	Pg	0	44				Local shock.
5		6	45				Tremor.
5	Pg	8	24	(30)			Very severe shock: seismograph put out of action.
5	Pg Sg	9	35	(0) 3		0.2	Large amplitudes. Also many small tremors recorded between 8h and 12h.
5	Pg Sg	11	33	(0) 3		0.2+	Large amplitudes.
5	Pg Sg	11	53	(0) 3		0.2	Large amplitudes.
5		16	36				Sharp shock, no phases shown.
5	Pg Sg	23	23	(0) 4		0.3	

Date. 1952	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
May 6	Pg Sg	18	18	(0) 4		0.3	
7		17	26				Feeble tremor.
8		1	6				Local tremor.
9	Pg Sg	22	47	(0) 4		0.3	
10		6	53				Prolonged tremor.
10	Pg Sg(?) M	10	29	(0) 4 15		0.3(?)	
11		0	22				Local tremor.
15		7	50				" " "
25		12	55				" " "
26	P S L	16	14	(0) 16 10 20		11.6	Large amplitude.
26		19	48				Slight tremor.
30		5	34				" " "
June 2		12	55				Feeble tremor.
7	P S M Sg	21	23	(0) 27 40 50		2.4	Large amplitudes.
10		11	37				Local tremor.
11		15	41				" " "
12	Pg Sg(?) M	5	37	(0) 7 17		0.5(?)	Prolonged shock.
15		23	56				Feeble tremor.
16	Pg	14	38	(0)			Very large amplitudes and con- fused movements: subsequent phases not visible.
24	Pg Sg	11	26	(0) 5		0.4	
27		1	8				Tremors.
27	Pg Bg	22	22	(30) 33		0.2	Large amplitudes: confused record.

Takaka

Lat. 40° 51' S : Long. 172° 48' E. Height above M.S.L. = 25 ft.

Lithologic Foundation : Alluvial gravels (Pleistocene).

INSTRUMENT

Imamura Strong-motion Seismograph: three components: oil damping.

CONSTANTS

Component	Free pendulum period	Damping ratio	Date of determination of damping	Magnification
N	10 sec	10:1	1932 May 15th.	2
E	10 "	13:1	" " "	2
Z	4 "	1.8:1	" " "	2



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Note: Values for pendulum periods and magnification as supplied by makers.

OBSERVER : Mr.W.J.Smith, Postmaster, Takaka.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 7	i	10	28	22			Local shock.
7	i	11	36	24			" " "
17	Pg Sg	9	44	58 45 10		0.9	
20	P S	9	32	(0) 22		1.9	
20	P S Sg	14	39	(40) 40 2 35		1.9	
May 5	P P ^x Pg S i Sg M	8	24	54 25 7 21 36 45 26 6 9	1	3.7	
13	P S Sg	13	35	(16) 35 44		1.7	
26	P PR1 i i i S M i i	16	13	9 24 54 14 39 15 28 16 0 21 25 18 0		15.5	May be S of second shock.
June 7		21	24				Slight tremors.
11	Pg Sg	0	38	(0) 1		0.1	

Christchurch (Magnetic Observatory)

Lat. 43° 52' S : Long. 172° 37' E. Height above M.S.L. = 25 ft

Lithologic Foundation : Gravels.

INSTRUMENT : Wood-Anderson Short-period Seismograph: magnetic damping.

OBSERVER : The Director, Magnetic Observatory, Christchurch.



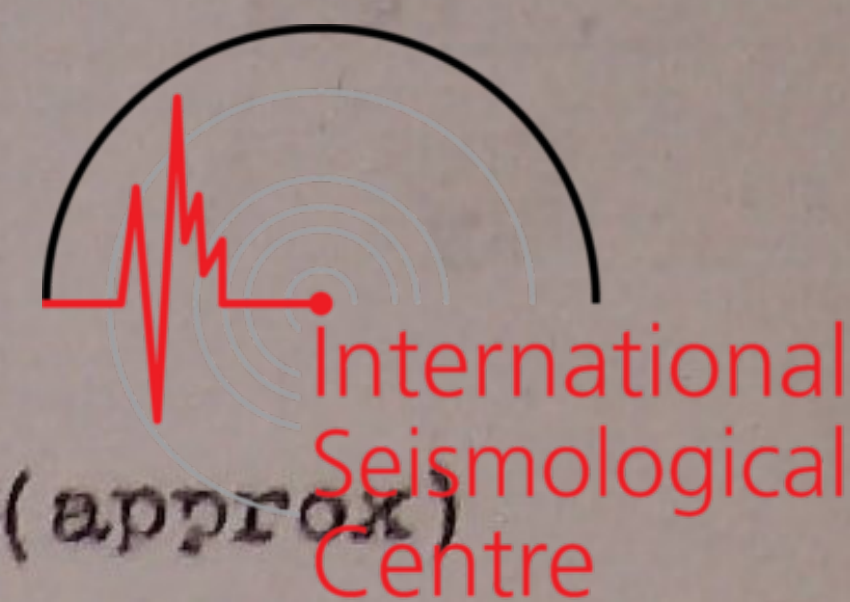
Date. 1952	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 5	P(?) S	20	42	40 45 2		12.8(?)	P very faint.
7		23	45				Tremors.
13	Pg Sg	11	58	44 57		1.0	
14	P S	11	18	44 19 2		1.6	
16	P S	5	5	5 29		2.1	
17	P S	9	44	40 45 1		1.8	
20	P Pg S	7	6	55 7 10 20		2.2	
20	P i Ps S S ^x Sg	9	32	37 44 51 55 33 2 11		1.6	
20	P S	11	45	18 39		1.8	
20	P Pq Pg S S ^x Sg	14	39	31 33 43 52 40 6 15		1.8	
24		0	18				Tremor.
24		16	15				"
28		3	11				"
29		18	16				"
30	P S M	5	11	45 12 24 28		3.4	

Date. 1952	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
May 5	P Pg Ps S(?) I S ^x (?) Sg(?) M	8	25	20 49 36 3 14 25 34 58 28 3		4.8(?)	S apparently in minute eclipse.
5		11	34				Tremors.
13	P	0	51	49			Faint record: subsequent phases not visible.
13	P S	13	35	38 36 7		2.55	
14		9	35				Slight shock.
14	Pg Sg(?)	10	11	19 28		0.7(?)	Confused movements: faint record.
15	P S L	13	21	13 29 15 40		58.3	
17		2	57				Tremors.
17	I	7	48	22			Felt locally, R-F 2.
22	P S M	1	55	17 47 50		2.6	
26	P S	16	13	22 15 40		12.4	
26	P I I S L M I I	16	13	32 14 55 15 22 16 2 40 17 20 56 18 59		13.5	Large amplitudes.
26	P S	22	25	35 28 43		17.1	
27	P S	1	33	28 36 19		15.5	
June 3		11	0				Tremors and L waves from distant shock.
7	P S M	21	23	50 25 3 25+		6.45	
11	P S	0	38(58)	39 24		2.3	P very small.
15	P(?) S	13	54(26)	55 17		2.7(?)	P very small and uncertain.
17	P P ^x Pg Sg M	14	39	5 20 34 40 32 59		4.2(?)	



SUPPLEMENT
Reports from Private Stations.

Seatoun



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Lat. $41^{\circ} 19' S$: Long. $174^{\circ} 48' E$. Height above M.S.L. = 10 ft. (approx)

INSTRUMENT : Inverted pendulum.

OBSERVER : Mr. C. J. Westland, F.R.A.S.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 7	P S	15	38	0 20		1.7	
16		5	5				There may be a small S-P interval amplitude 1.8 mm.
17	P e S	9	45	0 9 20		1.75	Amplitude 0.7 mm.
20		9	32				S-P interval not clear. Amplitude 1.3 mm.
20	P S(?)	14	40	0 18		1.6+	Amplitude 1.0 mm.
May 5	P S	8	24	(0) 29		2.5	Maximum amplitude 8.5 mm.
5		11	33				S-P interval uncertain: small amplitude.
26	1 1 P 1 e L M	16	12	0 5 9 13 41 14 18 40 50			May be S of first shock. Amplitude 4.3 mm.

Glenmuick

Lat. $42^{\circ} 54' S$: Long. $173^{\circ} 7' E$. Height above M.S.L. = 247 ft.

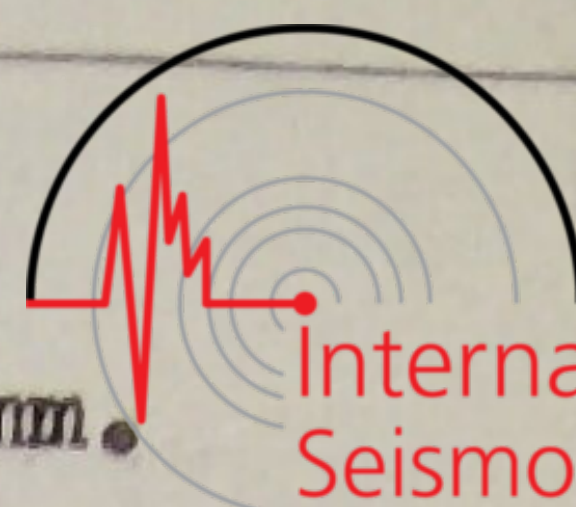
Lithologic Foundation : Gravel, on Tertiary Cretaceous and early Mesozoic rock.

INSTRUMENT : Inverted pendulum.

OBSERVERS : Mr. C. J. Westland, F.R.A.S. and Mr. A. S. Westland.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Apr. 8		0	22				Felt locally: amplitude 4.0 mm.
17	P S	9	45	0 16		1.4	Amplitude 1.8 mm.
20	Pg Sg	9	32	(0) 9		0.7	Felt locally: amplitude 0.7 mm.
20		11	46				Local: amplitude 0.3 mm.
20	Pg Sg	14	39	(0) 9		0.7	Felt locally: amplitude 2.3 mm.

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
May 5	P S Sg	8	26	(0) 52 27 0		4.7	P very feeble. Maximum amplitude 0.3 mm.
13	Pg Sg	0	52	(0) 5		0.4+	
13	P S	13	35	(0) 23		2.0	
26	P S	16	12	(0) 14 47		14.5	
26	P S M	16	12	(33) 15 16 36		14.0	Confused records. Amplitude 0.7 mm.
June 7	P S Sg	21	24	(0) 25 10 21		6(?)	P not clear.
16	P S	0	40	(0) 22		1.9	Amplitude 0.4 mm.
17	P S	6	8	(0) 16		1.4	
21	Pg Sg	16	16	(0) 13		1.0	
30	Pg Sg	21	7	(0) 7		0.5	Maximum amplitude 0.9.



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Department of Scientific and Industrial Research.

DOMINION OBSERVATORY, WELLINGTON, W.1,
NEW ZEALAND.

SEISMOLOGICAL REPORTS

FOR

JULY, AUGUST, SEPTEMBER,

1932.

IN this report, where the clock correction is not known, the time of P (or first phase recorded) is enclosed in a bracket.

The reports of the various stations are arranged in order of latitude from North to South, except that of the central station at Wellington, which is given first.

For notation see "Modern Seismology," by G. W. Walker; also "Monthly Notices of the Royal Astronomical Society, Geophysical Supplements."

Tables used: "Tables of the Times of Transmission of the P and S waves of Earthquakes," by Harold Jeffreys, 1932.

Observer: R. C. HAYES. Director: C. E. ADAMS, D.Sc., F.R.A.S.



Wellington (Dominion Observatory)

Lat. 41° 17' S : Long. 174° 46' E. Height above M.S.L. = 401.5 ft.

Lithologic foundation : Greywacke (early Mesozoic or late Palaeozoic).

INSTRUMENTS

Milne-Shaw Seismographs, numbers 13 and 36: magnetic damping.

Wood-Anderson Short-period Seismograph: magnetic damping.

Galitzin-Wilip Vertical Seismograph: photo-galvanometric registration, magnetic damping.



CONSTANTS

Seismograph and component	Date of Determination	Galvanometer Free period	Pendulum Free period	Damping ratio	$\frac{Ak}{\pi L}$
Milne-Shaw (N)	1932 Sep. 5th.		9.8 sec	20:1	
Milne-Shaw (E)	" " " 6th.		9.0 "	20:1	
Wood-Anderson (N)	" " Aug. 23rd.		0.8 "	12:1	
Galitzin-Wilip (Z)	1931 Jun. 22nd.	10.6 sec.	3.6 "	1.72:1	156.5

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 2		1	48			Local tremor.	
2	L	2	37				
2		13	31			Slight local tremor.	
4		13	27			" " " "	
5		3	26			" " " "	
7	S SR1(?) L M	16	40	52	15	68	
9	P i S L	13	1	47	15	24.7 Suva $\Delta=8^{\circ}0$, Riverview $\Delta=23^{\circ}5$, Manila $\Delta=54^{\circ}9$. Epicentre :- $18^{\circ} S : 168^{\circ} E$. Rather confused record.	
10	P Pg S Sg	7	32	16		1.2 Felt at Masterton, R-F 3. New Plymouth $\Delta=2^{\circ}55$. Epicentre :- $41^{\circ}0 S : 176^{\circ}3 E$.	
11	P S	10	18	14		1.8	
12	S(?) SR1(?) L M	19	49	0	25 17	75(?) S very small.	
14	P S(?) L	9	0	43		36.7(?) Records disturbed by microseism	
15	P S	2	58	18		1.9	
15		12	59			Small local shock.	
15		21	13			Traces.	
16		4	0			Slight Local shock.	

Date. 1952	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 17	Pg Sg	8	39	7 11		0.3	
17	P S	22	11	54 12 19		2.2	
20	P P ^x Pg S Sg	4	52	52 55 58 53 5 10		1.15	Az=NW. Widely felt in New Zealand, from Dargaville in the north to Akaroa in the south. R-F 7-8 in Taranaki, and along the coast as far south as Wanganui. Very large amplitudes. New Plymouth $\Delta=1^{\circ}2$, Hastings $\Delta=2^{\circ}2$, Arapuni $\Delta=2^{\circ}3$, Glenmuick $\Delta=3^{\circ}0$, Christchurch $\Delta=3^{\circ}7$. Takaka Az=NE. Epicentre :- $40^{\circ}0$ S : $174^{\circ}0$ E ^o Local tremors.
20		7	19				
20	P S M	13	15	30 58 16 2		2.5	Felt at Awakino and New Plymouth R-F 4.
20		19	8				Felt at Kahurangi Point, R-F 3.
20	P S L I	20	9	22 12 0 12+ 20 21 7		14.3	Suva $\Delta=10^{\circ}7$, Apia $\Delta=13^{\circ}$ (?). Approx. Epicentre :- 27° S : 177° W. Confused records: possibly two shocks superimposed.
21	P S SR L M	12	49	2 56 20 13 2 50 5 40 9	15	51.3(?)	P very small.
21	S(?) L	16	32	42		58(?)	
22	P S	0	1	1 26		2.2	Felt at Karamea, R-F 4.
22	P S	3	8	40 9 15		3.1	
23		0	54				Irregular tremors.
23	P Pg S	13	54	29 38 52		2.55	
24	I	6	43	24			Small tremors.
24	P S	14	44	32 54		1.9	Glenmuick $\Delta=2^{\circ}3$. Epicentre :- $40^{\circ}7$ S : $172^{\circ}3$ E.
25		3	17				Slight local tremor.
25	P S	5	49	44 50 20		3.2	
25	PR1(?) ScPcS S L M1 M2	9	31	25 37 2 38 56 10 1 4 6	8 18 20	100(?)	Very small. May be PS.



Date. 1952	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 26		15	41			Small local tremor.	
26	i	17	10			Local tremors.	
	i		15				
27	PS(?)	21	32	45	8	66(?)	
	S		36	45			
	SR1		41	40			
	SR2		45	34			
	L		49				
30	L	12	45		15	Traces.	
Aug. 1	P	1	21	22	1.9	New Plymouth $\Delta=3^{\circ}3$. Epicentre :- $41^{\circ}8$ S : $172^{\circ}2$ E.	
	S			46			
1		22	40			Small local tremor.	
2		4	50			Irregular tremors.	
2	P	13	47	25	1.4	Az=WNW(?). Felt in central parts of New Zealand, Max. R-F 6. Takaka $\Delta=0^{\circ}4$, New Plymouth $\Delta=1^{\circ}6$, Glenmuick $\Delta=2^{\circ}1$, Hastings $\Delta=2^{\circ}6$, Christchurch $\Delta=2^{\circ}9$. Approx. Epicentre :- $40^{\circ}7$ S : $173^{\circ}5$ E Large amplitudes.	
	Pg			28			
	Ps			34			
	S			40			
	Sg			48			
2	P	20	6	31	2.1	Felt at Kahurangi Point R-F 3.	
	S			53			
3		22	4			Small local tremor.	
5	P(?)	15	31	50	9.3(?)	Christchurch $\Delta=8^{\circ}1(?)$, New Plymouth $\Delta=8^{\circ}3(?)$. Epicentre :- 42° S : 162° E.	
	S		33	34			
	M		35				
6	Pg	16	33	59	0.6		
	Sg		34	7			
7	P	7	46	54	2.1		
	S		47	16			
8	P	1	50	23	1.3		
	S			38			
8	P	9	28	29	1.15		
	S			42			
8	e	14	51	50			
8	P	18	52	48	5.7	Felt at Wairoa, R-F 3.	
	S		53	53			
10		1	12			Prolonged tremors.	
10		17	42			Confused tremors.	
12	PS(?)	3	47	19	110(?)		
	L		4	16			
	M			24			
12	Pg	19	0	37	0.6		
	Sg			45			
12	i	22	13	35	16		
	L		16				
13		18	28			Local tremor	
13		19	57			Traces	

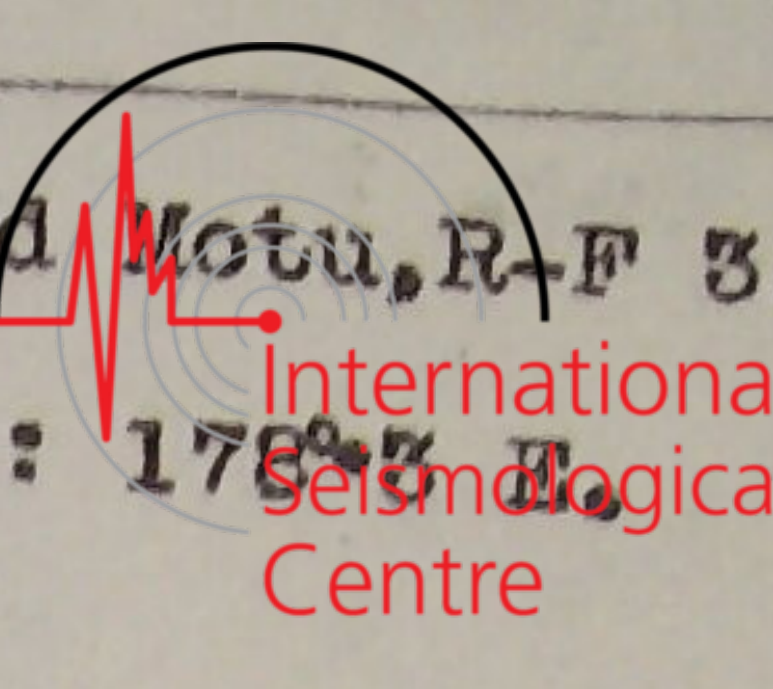


Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Aug. 13	eP iP PRI i S SRI L M	20	58	56		14.9	Az=NW(?). Felt in southern New Zealand, R-F 5 on Stewart Island. Christchurch $\Delta=9^{\circ}0'$, New Plymouth $\Delta=15^{\circ}4'$, Chatham Islands $\Delta=19^{\circ}3'$, Riverview $\Delta=18^{\circ}8'$, Adelaide $\Delta=25^{\circ}7'$, Apia $\Delta=41^{\circ}5'$. Epicentre in vicinity of:- $52^{\circ}S : 160^{\circ}E$. Large amplitudes.
14	P i S(?) SRI(?) L	4	57	10		68.2(?)	Irregular waves.
14		20	38				Small local tremor.
16	Pg Sg	4	19	14		0.6	
19	P Pg S	5	44	29		2.6	Felt at Nelson, R-F 4. New Plymouth $\Delta=1^{\circ}8'$. Epicentre :- $39^{\circ}0'S : 176^{\circ}5'E$.
19	L	14	53				Traces.
19		21	14				Felt at Rockville, R-F 5.
20		6	48				Tremors.
21	e L M	4	49			17	Records disturbed by wind.
22	L	16	30				Traces.
23	P S	8	47	59		2.8	Felt at Kahurangi Point, R-F 4. Glenmuick $\Delta=2^{\circ}4'$, New Plymouth $\Delta=2^{\circ}55'$. Epicentre in vicinity of :- $40^{\circ}5'S : 171^{\circ}5'E$.
23		7	41				Local tremors.
26	P S L M	13	20	26		17.7	
28	Pg Sg	2	21	43		0.5	
Sep. 1	Pg Sg	6	57	31		0.4	
3	L	4	47	14			Irregular waves: strong micro-seisms.
3	P S	7	33	45		1.3	Felt at Wanganui and Levin, max. R-F 4.
3		8	55				Slight local shock.
3		12	41				Traces.
4	i	19	28	20			Confused tremors.
7	P S	17	19	27		3.0	P very small. Apparently two shocks superimposed.

Date. 1952	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks
		h	m	s			
Sep. 7	P(?) S Sg(?)	17	19	50 20 29 34		3.7(?)	Rather confused with previous shock.
8		2	30				Traces: records disturbed by wind.
8	Pg Sg	16	25	57 26 12		1.1	
9	P S SR L	13	47	18 56 22 14 2 50 5	25	69.0	P small.
10	P S	17	48	56 49 39		3.8	Deep focus type of record. Felt in Gisborne-East Cape area R-F 6 at Waipiro Bay. New Plymouth $\Delta=3^{\circ}4$
15	P i P ^x Pg S Sg(?)	13	55	44 49 54 56 7 22 35	(Very large amplitudes)	3.3	Felt over whole of North Island except Auckland Peninsula. Exceeded R-F 9 in vicinity of Wairoa. Considerable damage to buildings in Gisborne and Wairoa. Hastings $\Delta=1^{\circ}2$, Dannevirke $\Delta=1^{\circ}9$, Arapuni $\Delta=2^{\circ}3$ New Plymouth $\Delta=3^{\circ}1$, Takaka $\Delta=4^{\circ}5$ Epicentre :- $38^{\circ}3$ S : $178^{\circ}4$ E.
15		14	5				Felt at Motu, R-F 4.
15	P S Sg(?) M	14	8	40 9 8 30 50		2.5	Felt at Motu, R-F 4 Large amplitudes, confused records
15		14	12				Confused local shock.
15	P i Pg(?) S Sg(?) M	14	18	6 25 32 42 19 3 15		3.2	Felt north of Hawke's Bay, Max. R-F 5. Hastings $\Delta=1^{\circ}2$, New Plymouth $\Delta=3^{\circ}4$. Epicentre :- $39^{\circ}7$ S : $178^{\circ}4$ E. Large amplitudes.
15		14	24				Local tremors.
15		14	30				Felt at Motu, R-F 2.
15		14	43				Local tremors.
15	P P ^x S i i i	14	52	4 13 38 47 59 53 7		3.0	Felt north of Hawke's Bay, max. R-F 6. Hastings $\Delta=1^{\circ}0(?)$ Arapuni $\Delta=2^{\circ}3$, New Plymouth $\Delta=2^{\circ}9$. Approx. Epicentre :- $39^{\circ}4$ S : $178^{\circ}0$ E.
15		15	5				Prolonged local tremors.
15	P S	15	27	54 28 32		3.3	Felt at Motu, R-F 3. Hastings $\Delta=1^{\circ}8(?)$, New Plymouth $\Delta=3^{\circ}0$. Approx. Epicentre :- $39^{\circ}15$ S : $178^{\circ}0$
15		15	43				Felt at Motu, R-F 2
15		15	48				Local tremors.



Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.				
		h	m	s							
Sep. 15	P S	15	59	34	3.4	Felt at Whakatane and Motu, R-F 3. New Plymouth $\Delta=3^{\circ}25$. Epicentre :- $39^{\circ}4$ S : $178^{\circ}3$ E. Felt at Motu, R-F 3.					
15		17	4	" " " "							
15		17	25	" " " "							
15		18	30	Feeble local shock.							
15		18	40	Prolonged local shock.							
15		19	44	Felt at Motu, R-F 3.							
15		21	24	" " " R-F, 2.							
15		21	37	Local tremor.							
15	P S	22	39	32		2.6	Felt at Motu, R-F 2. New Plymouth $\Delta=2^{\circ}9$. Epicentre :- $39^{\circ}9$ S : $177^{\circ}8$ E.				
15		23	15	Slight local tremor.							
15		23	57	" " " "							
16		2	43	Felt at Waipiro Bay, R-F 2.							
16	P S	4	34	36	3.4		Felt at Motu, R-F 3. New Plymouth $\Delta=3^{\circ}0$. Epicentre :- $39^{\circ}0$ S : $178^{\circ}0$ E.				
16		9	12	Felt at Motu, R-F 3.							
16		9	19	" " " "							
16	P S	9	38	23 54			2.7	Felt at Motu, R-F 3. New Plymouth $\Delta=3^{\circ}4$. Epicentre :- $40^{\circ}4$ S : $178^{\circ}2$ E.			
16		11	43	Local tremor.							
16	P S	19	33	22 54				2.8	Hastings $\Delta=1^{\circ}7$ (?), New Plymouth $\Delta=3^{\circ}2$. Epicentre :- $40^{\circ}0$ S : $178^{\circ}1$ E.		
16	P S	19	35	56 30		3.0			New Plymouth $\Delta=2^{\circ}8$. Epicentre :- $39^{\circ}3$ S : $177^{\circ}8$ E.		
16	P Pg S S ^x Sg(?)	23	16	27 53 17 4 21 44					3.25	Felt at Tologa Bay and Motu, max. R-F 3. Hastings $\Delta=1^{\circ}1$, New Ply- mouth $\Delta=2^{\circ}8$, Christchurch $\Delta=5^{\circ}8$ Epicentre in vicinity of :- $38^{\circ}9$ S : $177^{\circ}8$ E. Large amplitudes.	
17	P Pg S S ^x	6	12	20 46 13 0 14						3.5	Felt at Motu, R-F 4. Hastings $\Delta=1^{\circ}2$, New Plymouth $\Delta=3^{\circ}0$. Epicentre :- $38^{\circ}75$ S : $178^{\circ}0$ E.
17		15	45	Local tremor.							
17		19	19	" "							
17		20	47	" "							
18		1	42	Felt at Motu, R-F 3.							
18	P Pg S Sg	17	36	36 1 12 33	3.2		Felt at Motu, R-F 4. Hastings $\Delta=0^{\circ}9$ New Plymouth $\Delta=2^{\circ}9$. Epicentre :- $39^{\circ}1$ S : $177^{\circ}9$ E.				



Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Sep. 19	P S	0	52	49		2.2	Deep focus type of record.
20	P S(?)	4	18	46		1.5(?)	
20	P S	19	0	14		3.2	Felt at Wairoa, R-F 5. New Plymouth $\Delta=3^{\circ}2$. Epicentre :- $39^{\circ}5$ S : $178^{\circ}2$ E.
21		8	15				Prolonged shock, felt north of Hawke's Bay, max. R-F 6.
21		14	15				Slight local shock.
21	P S	14	30+				P very small.
			30	54			
23	P S	14	34	49	6	87.0	Irregular waves.
			45	28			
24	P S	16	30	36		3.5	Tuai $\Delta=0^{\circ}5$. Epicentre :- $38^{\circ}7$ S : $177^{\circ}8$ E.
			31	16			
25	P Pg(?) S	0	3	20		2.5	
				38			
				48			
25	L	9	3		14		Traces.
26	e L	19	51	40			
		20	29				
27	P Pg Sg	4	50	57		3.3	Felt at Opotiki and Motu, R-F 4. Tuai $\Delta=0^{\circ}3$, Hastings $\Delta=0^{\circ}9$, New Plymouth $\Delta=3^{\circ}9(?)$. Christchurch $\Delta=5^{\circ}7$. Epicentre in vicinity of :- $38^{\circ}8$ S : $177^{\circ}6$ E.
							Felt at Wairoa, R-F 4.
27		6	47				
28	Pg Sg	10	15	24		0.7	
				33			
28	P Pg Sg M	20	14	38		3.7	Felt north of Hawke's Bay, max. R-F 6. Tuai $\Delta=1^{\circ}0(?)$, Hastings $\Delta=1^{\circ}0(?)$, New Plymouth $\Delta=3^{\circ}7(?)$ Glenmuick $\Delta=5^{\circ}2$, Christchurch $\Delta=6^{\circ}0(?)$. Approx. Epicentre :- $39^{\circ}7$ S : $178^{\circ}8$ E.
					(Large amplitudes)		
29	L	18	28		17		
30	P S	11	19	58		3.5	Felt north of Hawke's Bay, max. R-F 5. New Plymouth $\Delta=2^{\circ}9$, Christchurch $\Delta=5^{\circ}9$, Epicentre :- $38^{\circ}9$ S : $177^{\circ}9$ E.
			20	38			
30	P	14	39	16			Confused shock, other phases not clear. Felt north of Hawke's Bay max. R-F 5.



Suva, Fiji

Lat. 18° 9' S : Long. 178° 26' E. Height above M.S.L. = 10 ft.

INSTRUMENT

Milne Twin-boom Seismograph: undamped.

CONSTANTS



Component	Date of determination	Pendulum period	Magnification
N-S	1932 August 3rd.	17.1 sec.	6
E-W	" " " "	10.3 sec.	6

OBSERVER : Miss Mune, Telephone Exchange, Suva.

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 7	S SR1 L M	16	39	0		74	
7			44	5			
			53	30			
		17	1				
7		21	3				Tremors.
9	P S L M	12	59	15		7.8	
		13	0	45			
			1	20			
				36			Rather large amplitudes.
12	P S SR1 L M	19	35	20		77.3	
			45	10			
			51	40			
		20	2	40			
			10	30			
13		11	27				Slight tremor.
14		9	0				" " "
20	P S M	20	8(36)			10.7	
			10	36			
			11	30			
21		12	55				Tremors.
25	FR1 SR1 SR2 L M	9	22 (0)				
			37	40			
			43				
			54				
		10	0				
27		21	21				Slight tremors.
Aug. 6	e i M	8	33	36			
			35	35			
			36				
8	P(?) S(?) M	14	41	36		14.6(?)	
			44	18			
			45+				
10	i e M	0	57	0			
		1	7	0			
			9				
12		4					Prolonged tremors.
13		13	57				Tremors.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Aug. 13	P(?) S(?) M1 M2	21	5	30		48.5(?)	
			12	30			
			15				
			19				
20		8	41				Tremors.
21		4	36				Prolonged tremors.
30	e	19	8	30			
Sept. 1	e	10	49	30			
5		4	35				Tremors.
4		19	18				" "
4	e M	20	22	24			
			24	0			
9	P S L	13	48	33		52.8	
			56	0			
		14	5				
15	P S M1 L M2	13	59	51		24.4	New Zealand Earthquake.
		14	4	9			
			5				
			7				
			9				
23	S(?) i SR1(?)	14	43(40)				
			45	40			
			49	50			
25		8	49				Tremors.
29		18	7				Prolonged tremors.



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Arapuni

Lat. 38° 5' S : Long. 175° 39' E. Height above M.S.L. = 212 ft.
Lithologic Foundation : Rhyolite tuffs (Pliocene), more than 300 ft.
thick, probably on Mesozoic rock.

INSTRUMENT : Milne Seismograph, E-W component, undamped.

CONSTANTS : Pendulum period (1932 Aug. 31) = 30 sec. Magnification = 5.6

OBSERVER : District Engineer, Public Works Department, Arapuni.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 20	P Pg S Sg i	4	53	4		2.3	
				17			
				30			
				42			
				50			
20	P(?) S	20	9	20		8.0(?)	P small.
			10	50			
Aug. 13	e S L(?) M	21	1	58			Very small.
			2	55			
			3	27			
			4	5			

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Sept. 15	P	13	55	29	2.3	Large amplitudes.	
	P*			35			
	Pg			45			
	S			55			
15	S	14	18	0			
15	P	14	51	51	2.3		
	Pg		52	4			
	S			17			
	Sg(?)			42			



Tuai

Lat. 38° 48' S : Long. 177° 9' E. Height above M.S.L. = 960 ft.
 Lithologic foundation: Gravels (Pleistocene) probably 100 ft thick,
 on argillaceous sandstones and argillites (papas) (middle Tertiary).
 INSTRUMENT : Milne-Jaggard Seismograph.
 OBSERVER : Resident Electrical Engineer, Tuai.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Sept. 21	Pg	8	5	(0)		0.8	
	Sg			11			
24	Pg	16	33	(0)		0.5	
	Sg			7			
27	Pg	4	50	(0)		0.3	
	Sg			4			
28	P	20	15	(0)		0.9(?)	
	Pg(?)			2			
	S(?)			9			
	Sg			14			
30		11	15			Tremors.	

New Plymouth

Lat. 39° 4' S : Long. 174° 4' E. Height above M.S.L. = 112 ft.

Lithologic foundation : Ash, agglomerate and lava at least 100 ft. thick, on argillaceous sandstones and mudstones (Pliocene).

INSTRUMENT : Wood-Anderson Short-period Seismograph: magnetic damping.

OBSERVER : Mr. W. H. Todd, Warder, The Prison, New Plymouth.



Date. 1952	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 5		3	27				Confused local shock.
10	P P S Sg	7	32(12)			2.55	
			22				
			41				
			56				
17		22	12				Prolonged shock: phases not clear.
20	P S	4	52 47			1.2	From Milne-Jaggard record. Large amplitudes.
			53 4				
20	Pg Sg	13	15(39)			0.4	
			45				
20	P S	20	9 38			13.7	
			12 10				
22		0	1				Tremors.
24		14	45				" "
26	Pg Sg	15	41 24			0.9	
			36				
Aug. 1	P S	1	21 36			3.2	
			22 12				
2	P S	13	47 33			1.6	From Milne-Jaggard record.
			51				
5	P S	15	32 26			8.3(?)	P not clear.
			34 0				
7	P S	7	47 (5)			2.0	
			28				
8	P S	1	50 36			1.3	
			51				
8		18	53				Prolonged tremors.
9	Pg Sg	18	33 1			0.7	
			10				
12		22	12				Prolonged tremors.
13		18	28				Slight tremors.
13	P i S(?) L	20 59 19				15.4(?)	
		21 1 25					
		2 9					
		45					

Date. 1958	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Aug. 19	P Pg S Sg	5	44	15 21 36 48		1.8	
23	P Pg S	8	41	16 36 45		2.55	
24		23	2				Slight tremors.
Sept. 3	P S	7	33	42 58		1.4	
7	P S	17	19	9 28		1.7	
7	P S	17	19	41 20 0		1.7	
8	Pg Sg	16	25	56 26 10		1.0	
10	Pg Sg	15	11(14)	20		0.4	
10	P S	17	48	25 49 4		3.4	
15	P Pg i S Sg i	13	55	32 42 49 56 7 28 47		3.1	
15	P S	14	8	26 9 2		3.2	
15	P S	14	11	30 12 4		3.0	
15	P S	14	17	59 18 38		3.4	
15	P S	14	24	6 42		3.2	
15		14	41				Tremors.
15	P S	14	51	58 52 31		2.9	
15		15	3				Prolonged tremors.
15		15	12				Tremors.
15	P S	15	42	42 43 19		3.2	
15		15	47				Tremors.
15	P S	15	59	28 16 0 5		3.25	
15		17	3				Confused shock.



Date. 1938	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Sept. 15	P S	17	25	30		3.1	
15			26	5			
15		17	40				Tremors.
15	P S	18	39	55		3.25	
			40	32			
15	P S	18	41	57		3.2	
			42	33			
15		19	42				Tremors.
15		21	23				Confused shock.
15	P S	21	36	54		3.1	
			37	29			
15	P S	22	39	20		2.9	
				53			
15		23	14				Tremors.
15		23	45				" "
15		23	54				" "
16		2	12				" "
16		3	40				" "
16	P S	4	34	38		3.0	
			35	12			
16		8	9				Tremors.
16		9	17				" "
16	P S	9	11	49		3.1	
			12	24			
16	P S	9	38	18		3.4	
				57			
16		11	55				Tremors.
16	P S	14	9	51		2.9	
			10	24			
16		17	3				Feeble tremors.
16	P S	19	33	21		3.2	
				57			
16	P S	19	35	59		2.8	
			36	31			
16	P Pg S Sg(?)	23	16	25		2.8	
				42			
				57			
			17	24			
16		23	40				Tremors.
16	P S	23	47	39		3.2	
			48	15			



Hastings

Lat. $39^{\circ} 38' S$: Long. $176^{\circ} 53' W$. Height above M.S.L. = 35 ft.
 Lithologic foundation : Alluvial sands, silts and gravels (recent Pleistocene) at least 500 ft. thick, probably on limestone and sandstone (early Pliocene).

INSTRUMENT : Milne-Jaggard Seismograph.

OBSERVER : Mr. Henry deDenne, 304 South Nelson Street, Hastings.

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Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 12		13	19			Feeble tremor.	
12		14	8			" " "	
13		1	28			Prolonged tremors.	
20	P P ^x Pg Ps(?) S Sg M1 M2	4	53	(0) 5 9 22 25 37 48 54 10		2.2	Large amplitudes.
20	Pg Sg	7	20	(0) 7		0.5	
Aug. 2	P Ps S Sg(?)	13	48	(0) 19 30 52		2.6	
7		1	17				Feeble tremor.
13		3	24				Slight local shock.
19	Pg Sg M	5	44	(0) 4 10		0.3	Large amplitudes.
19		21	53				Small tremor.
27		2	17				Local shock.
27		10	49				" " "
31		11	6				Slight tremor.
Sept. 1		17	33				" " "
15	Pg Sg	13	56	(0) 17		1.2	Very large amplitudes.
15	Pg Sg	14	17	(30) 47		1.2	Confused with tail of previous shock.
15	P S	14	52	(0) 13		1.2	
15	P Pg S	15	28	(0) 12 21		1.8	
15		18	40	(0)			Irregular shock.
15		22	40	(0)			" " " "

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Sept. 16		4	35	(0)			Small tremor.
16		9	38	(0)			Irregular movements.
16	P i S(?)	19	33	(0) 9 19		1.7(?)	
16	Pg Sg	23	17	(0) 15		1.1	
17	Pg i Sg	6	12	(0) 6 16		1.2	
17		15	45	(0)			Tremor.
17		19	18	(0)			" "
17		22	47	(0)			" "
18	Pg Sg i	17	36	(30) 42 37 5		0.9	Apparently a second shock.
20		19	1				Local tremor.
21		8	15				Long irregular tremor.
21		14	30				" " " " "
24		0	10				Small tremor.
24	i	2	18	(0)			Sharp local shock.
24		5	49				Small tremor.
24		16	31	(30)			Confused shock.
25		0	3				Small tremor.
27	Pg Sg i	4	51	(0) 12 22		0.9	
27		6	47				Small tremor.
28	Pg Sg i i	20	14	(0) 14 22 32		1.0(?)	
29		1	40				Feeble tremor.
30		11	19	(0)			Irregular shock.
30		14	41	(0)			" " " "



Date. 1952	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Sept. 17	P Pg i S	6	12	24 28 49 58		3.0	
17	P S	15	55	26 56		2.6(7)	P very small.
17		17	59				Tremors.
17	P S	19	18	36 19 9		2.9	
17	P S	22	47	0 36		3.2	
18		1	42				Tremors.
18	P S	17	36	39 37 12		2.9	
20	P S	4	19	17 55		3.3	
20	P S	19	0	10 46		3.2	
21	P S	8	15	14 47		2.9	
21		14	16				Tremors.
21		14	30				" "
22		15	25				" "
23		14	36				" "
24		16	32				" "
25	P S	0	5	(9) 27		1.6	
27	P Pg S	4	50	47 51 0 31		3.9(?)	
27	P S	6	47	29 48 1		2.8	
28	P S	12	0	9 26		1.5	
28	P S	14	58	14 30		1.4	
28	P S(?)	20	14	36 15 18		3.7(?)	
30	P S	11	19	59 20 32		2.9	
30	P S	14	42	58 43 32		3.0	



17 Takaka

Lat. 40° 51' S : Long. 172° 48' E. Height above M.S.L. = 25 ft.

Lithologic foundation : Alluvial gravels (Pleistocene)

INSTRUMENT

Imamura Strong Motion Seismograph: three components: oil damping.



CONSTANTS

Component	Free pendulum period	Damping ratio	Date of determination of damping	Magnification
N	10 sec.	12:1	1932 Sept. 8th.	2
E	10 "	10:1	" " " "	2
Z	4 "	1.7:1	" " " "	2

Note: Values for pendulum periods, and magnification, as given by makers.

OBSERVER : Mr. W. J. Smith, Postmaster, Takaka.

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 20	P S ^x Sg	4	52	(38) 56 58			Az=NE. Large amplitudes.
Aug. 2	Pg Sg	13	45	(15) 20		0.4	
7	Pg Sg	7	47	(0) 2		0.1	
13	S	21	0	32			Distant shock.
Sept. 15	P Pg(?) S. S ^x M	13	56	1 19 52 57 7 31		4.5	Large amplitudes.
15		14	20				Tremors.
15		14	53				" "

Christchurch (Magnetic Observatory)

Lat. 45° 32' S : Long. 172° 37' E. Height above M.S.L. = 25 ft.

Lithologic foundation : Gravels.

INSTRUMENT : Wood-Anderson Short-period Seismograph.

OBSERVER : The Director, Magnetic Observatory, Christchurch.



Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 13	P S	7	12	18 54		3.2	P very small.
15	Pg Sg	2	58	28 36		0.6	
20	P P ^x Pg Ps S Sg i	4	53	20 32 39 52 54 2 20 39		3.7	From copy of Galitzin record.
22		0	1				Confused shock: P not clear.
22		3	10				Tremor.
Aug. 1	P S	22	40	15 28		1.15	
2	P Pg Ps S Sg	13	47	47 58 48 12 20 37		2.9	
5	P i i i S Sg	15	31	45 32 12 30 33 0 16 48		8.1(?)	P small.
8		18	54				Tremors.
13	eP iP i i S(?)	20	58	24 29 59 21 49 21 0 10		9.0(?)	Large amplitudes.
27	Pg Sg	18	25	23 30		0.7	
Sept. 15	P P ^x	13	56	23 38			Very faint records: subsequent phases not readable.
15	P	14	52	43			Very faint records.
16	P Pg S Sg	23	16	48 17 14 54 18 22		5.8	

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks,
		h	m	s			
Sept. 17	P Pg I	6	13	42 6 15			
18	P Pg(?)	17	36	45 37			P very small.
20	P S	4	19	16 36	1.75		
21		8	16				Tremors.
27	P Pg Sg	4	51	30 42 53	5.7		
28	Pg Sg	13	33	53 56	0.2		
28	P Pg S(?) Sg(?)	20	15	30 52 16 17	6.0(?)		
30	P S	11	20	43 50	5.9		



SUPPLEMENT
Reports from Private Stations

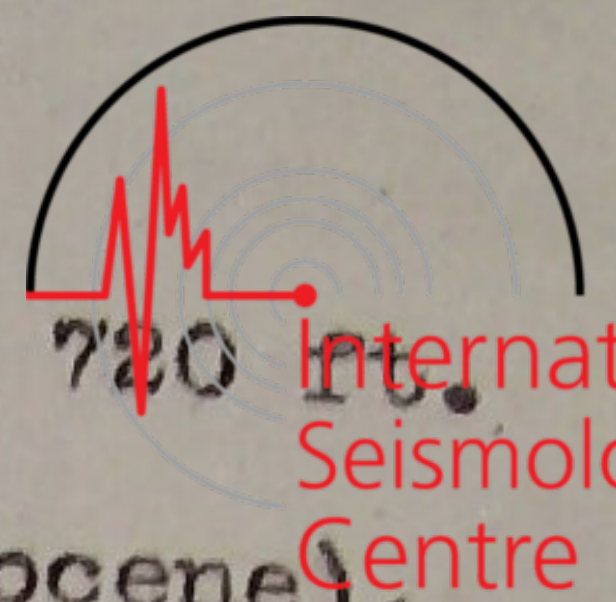
Dannevirke

Lat. 40° 18' S : Long. 176° 7' E. Height above M.S.L. = 720 ft.

Lithologic foundation : Alluvial deposits (probably Pleistocene).

INSTRUMENT : Milne-Jaggard Seismograph.

OBSERVER : Mr. L. Bastings, M.Sc. High School, Dannevirke.



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Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 20	P Ps(?) i	4	53	18 27 38			May be S or S ^x
Sept. 15	P i Pg i S i Sg M	13	55	32 36 40 45 54 57 56 1 13		1.9	

Glenmuick

Lat. 42° 54' S : Long. 173° 7' E. Height above M.S.L. = 247 ft.

Lithologic foundation : Gravel, on Tertiary Cretaceous and early Mesozoic rock.

INSTRUMENT : Inverted pendulum.

OBSERVERS : Mr. C. J. Westland, F.R.A.S. and Mr. A. S. Westland.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
July 8		3	28				Confused record.
20	P Pg(?) S	4	52	(37) 53 7 11		3.0	
20	Pg Sg	20	12	(0) 10		0.7(?)	
24	P S	14	43	(0) 26		2.3	Amplitude 0.6 mm.
Aug. 1	P S	22	40	(0) 12		1.1	
2	P S	13	48	(0) 24		2.1	
13	e1 e2 S L	20	56	5 57 26 58 0 47		14.6	

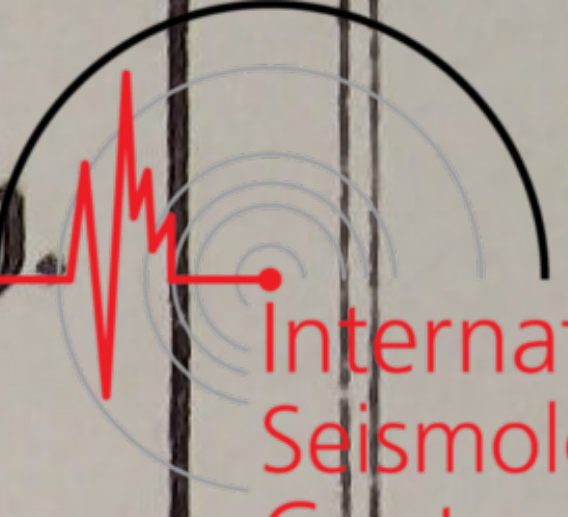
Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Aug. 25	P(?) S(?) M	8	48	(0) 27 29		2.4(?)	
27	Pg Sg	18	25	(0) 4		0.3	Felt locally, R-F 3.
Sept. 15	e i S L	13	54	(0) 42 0 20		8	Very large amplitudes, boom striking against stops.
15	P S L	14	19	(18) 54 12		8.5	Amplitude 5 mm.
15		14	53				Confused tremors.
16	e M	23	17	(0) 10			
17	e M	6	13	(0) 8			
19	Pg Sg	17	41	(0) 12		0.9	
20		14	20				Local shock: confused record.
21	Pg Sg	14	20	(0) 7		0.5	Felt at Rotherham.
27	P Pg S(?) Sg	4	50	(18) 0 42 0	4	4.4(?)	
28	P Pg Sg e	20	14	53 11 23 38		5.2	



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Department of Scientific and Industrial Research.

DOMINION OBSERVATORY, WELLINGTON, W. I,
NEW ZEALAND.



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SEISMOLOGICAL REPORTS

FOR

OCTOBER, NOVEMBER, DECEMBER,

1932.

IN this report, where the clock correction is not known, the time of P (or first phase recorded) is enclosed in a bracket.

The reports of the various stations are arranged in order of latitude from North to South, except that of the central station at Wellington, which is given first.

For notation see "Modern Seismology," by G. W. Walker; also "Monthly Notices of the Royal Astronomical Society, Geophysical Supplements."

Tables used: "Tables of the Times of Transmission of the P and S waves of Earthquakes," by Harold Jeffreys, 1932.

Observer: R. C. HAYES. Director: C. E. ADAMS, D.Sc., F.R.A.S.

Wellington (Dominion Observatory)

Lat. 41° 17' S : Long. 174° 46' E. Height above M.S.L. = 401.5 ft.

Lithologic Foundation : Greywacke (early Mesozoic or late Palaeozoic)

INSTRUMENTS

Milne-Shaw Seismographs, numbers 13 and 36: magnetic damping.

Wood-Anderson Short-period Seismograph: magnetic damping.

Galitzin-Wilip Vertical Seismograph: photo-galvanometric registration, magnetic damping.

CONSTANTS

Seismograph and component	Date of Determination	Galvanometer Free period	Pendulum Free period	Damping ratio	$\frac{Ak}{\pi L}$
Milne-Shaw (N)	1932 Sep. 5th.		9.8 sec	20:1	
Milne-Shaw (E)	" " 6th.		9.0 "	20:1	
Wood-Anderson (N)	" " 23rd.		0.8 "	12:1	
Galitzin-Wilip (z)	1931 " Jun. 22nd.	10.6 sec.	3.6 "	1.72:1	156.5

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Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Oct. 1	L	8	18		13		
1	L	9	53		11		
1		18	30				Traces.
2	e L	3	30 55		17		
2	L	5	58		17		
2		9	13				Local tremor.
3	L	7	47		15		
3	P S	21	29 51	30		1.8	
4	P S	20	13 50	25		2.2	Felt at Westport and Hokitika, R-F 4. Glenmuick $\Delta=2^{\circ}4$, Christchurch $\Delta=2^{\circ}6$, New Plymouth $\Delta=2^{\circ}6$. Epicentre :-41 $^{\circ}5$ S:171 $^{\circ}9$ E.
5	P S	2	6 7	37 0		2.0	Glenmuick $\Delta=1^{\circ}4$, Christchurch $\Delta=1^{\circ}8$, New Plymouth $\Delta=3^{\circ}6$ (?) Epicentre :-41 $^{\circ}8$ S: 172 $^{\circ}2$ E.
5	P S	9	10 20	1		1.7	Felt in centre of North Island, R-F 4. New Plymouth $\Delta=1^{\circ}5$ Epicentre :- 39 $^{\circ}7$ S : 175 $^{\circ}8$ E.
6	P S	22	29 30	53 30		3.5	
9		6	47				Slight local shock.
9		18	22				Tremors.
10		0	46				" "
10	P S	21	32 50	34		1.4	
11	Pg Sg	3	17 25	16		0.7	
13	P S	22	39 24	0		2.1	Felt at Murchison, R-F 3. Christchurch $\Delta=1^{\circ}8$, New Plymouth $\Delta=3^{\circ}5$. Epicentre in vicinity of: 42 $^{\circ}3$ S : 172 $^{\circ}3$ E.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Oct. 14		6	48			Prolonged local tremors.	
14		11	55			Felt north of Hawke's Bay, R-F 3.	
16	Pg Sg	8	34	30 38		0.6	
16	L M	12	54		16		
16	P S	14	59	46 15 1 10		7.4	Deep focus type of record. Felt at Waipiro Bay, R-F 2. New Plymouth $\Delta=7^{\circ}2$, Christchurch $\Delta=9^{\circ}6$. Epicentre in vicinity of :- 37° S : 176° W.
16	P S	16	47	22 55		2.9(?)	P very faint.
16		21	8				Tremors.
17	P(?) S(?) SR2 L M	13	34	25 41 8 45 46 47 45 48	16	45.7(?)	Maximum well marked, but ampli- tudes small. Traces: heavy microseisms.
17		19	42				
20	P S Sg(?)	17	39	40 41 39 42 41		10.6	Deep focus type of record.
24		19	38				Slight local shock.
26		11	57				Local tremors.
26		19	38				Traces.
26		23	33		16		Long series of waves.
27	L	4	0		15		Traces.
27	L	13	30				Traces.
28	Pg Sg	1	25	0 8		0.6	
28	P S	1	28	39 54		1.3	
29		9	3				Slight local tremors.
30	P S	21	59	15 54		3.4	Felt north of Hawke's Bay, R-F 6. Hastings $\Delta=1^{\circ}1$, New Plymouth $\Delta=3^{\circ}2$. Epicentre :- $39^{\circ}2$ S : $178^{\circ}3$ E.
Nov. 1	Pg Sg	16	46	3 18		1.3	
2	L SR L	11	13	48 22 20 29	11	75(?)	May be S.
3		23	12				Tremors. Records disturbed by high wind.
4	L	18	12	20			
6	P S	23	40	32 48		1.4	Felt at Wanganui, R-F 4. New Plymouth $\Delta=1^{\circ}5$ Epicentre :- $39^{\circ}9$ S : $175^{\circ}6$ E.



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Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Nov. 12	P S	1	47	59		2.3	
			48	25			
13	P PR S L(?)	4	59	30		86.1	
		5	4	21			
			10	5			
			26				
13	e L	15	58		20		
		16	10				
13	P S	21	38	1		1.3	
				16			
14	P S	7	38	36		1.4	
				52			
14	e L	19	13	0	9		
			17				
15	P S	7	59	9		8.2	
		8	0	42			
17	e L	9	40	30	17		
			45	0			
18		5	45				Local tremors.
18	e L	9	40		18		
			43				
18	P S	18	37	48		1.3	
			38	3			
19		14	7				Prolonged local tremors.
20		16	34				Traces.
21	Pg Sg	2	38	52		0.7	
			39	2			
22		15	14				Traces.
23	P S	3	50	53		1.3	
			51	8			
23		9	12		10		Tremors. Records disturbed by high wind.
23		15	6				Prolonged local tremors.
26	L	5	7	36	21		
26	e	13	12	20			Irregular movements.
26	P S	14	49	5		1.3	Felt in central parts of North Island, R-F 3.
				20			
27	S(?)	18	52	15			Very small shock.
28	P(?) S	21	22	4		3.2(?)	P very doubtful. Felt north of Hawke's Bay, R-F 4
				40			
29		1	13		12		Tremors.
29		2	0				" "
29	P S L	11	23	32		82.7	
			33	50			
			50		30		

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Nov. 30		3	40			Small tremors.	
30		11	11			Small local tremor.	
30		18	17			" " " "	
Dec. 1		18	55			Irregular movements.	
2	P S Sg	22	37	20 38 13		3.7(?) P very small.	
3	Pg Sg S(?)	4	59	26 32 34		0.4	
3	L M	6	32	36	16		
3	L	18	0		17	Traces.	
4	P S SR1 SR2 L M1 M2	8	21	58 30 50 35 0 36 30 40 49 54	10 18 18	66.8	
4	i	10	52				
5	P S	14	56	11 35		2.1	
6	i M	12	11	30 15	12		
7		15	1	20		Small local tremor.	
7	i L	16	46	17 17 10	17	Long series of waves.	
10	P S	4	4	12 10 0		32.0(?) Phases doubtful.	
10	P S	5	47	55 48 18		2.0	
10	L	10	33		16		
10	P Pg S Sg(?)	14	53	34 46 58 54 4	2.1	Felt in southern Hawke's Bay, maximum R-F 5. Tuai Δ=0.8(?), Dannevirke Δ=1.4(?), New Plymouth Δ=2.1. Epicentre: 39°7'S:176°7'E.	
11	Pg Sg	12	59	18 29		0.8	
13		18	17	48		Small local shock.	
16	P S Sg i	17	9	3 31 54 10 12		2.5(?) Felt north of Hawke's Bay, max. R-F 5. Tuai Δ=0.7, Hastings Δ=0. New Plymouth Δ=2.6, Glenmuick O=5.3(?), Christchurch Δ=5.7(?). Epicentre in vicinity of :- 39°5 S : 177°5 E.	
20	P S	4	54	51 55 23		2.8(?) P very small.	



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Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Dec. 20		7	38				Felt at Dannevirke, R-F 2.
21	(S) PS SR1 SR3 L M1 M2 M3	6	34	53		108	
			37	15			
			42	56			
			51	6			
			58	21	12		
		7	6		18		
			10		16		
			13		19		
21	P S	10	13	24		1.8	
				44			
21		13	58				Slight local tremor.
23	P S	3	32	53		1.3	
			33	8			
23	e L	18	27	0	12		
			37				
24	P PR S i L M	6	38	59	4	45.0	
			41	0	5		
			45	38	10		
			50	10			
			52				
			53		15		
25	P PR1 S PS PPS SR2 L M	2	18	50		98	
			23	24	5		
			30	35	10		
			32	50			
			34	8			
			42	24			
			51				
			54		40		
25		19	4				Felt at Gisborne, R-F 2.
26	Pg Sg	9	48	18		0.4	
				23			
26	e	16	53				
29		21	7				Tremors.
31	L	7	24				Traces.



Suva, Fiji

Lat. 18° 9' S : Long. 178° 26' E. Height above M.S.L. = 10 ft.

INSTRUMENT

Milne Twin-boom Seismograph: undamped.

CONSTANTS



Component	Date of determination	Pendulum period	Magnification
N-S	1932 Nov. 15th.	15.0 sec	6
E-W	" " "	8.5 "	6

OBSERVER : Miss Mume, Telephone Exchange, Suva.

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Oct. 1	P S	8	8	(30)		13.0	
1	P S	9	44	(6)		13.9	
2		3	50				Prolonged tremors.
2		5	51				Tremors.
2	e1 e2 e3 M	13	31	20			
			35	36			
			39	0			
			40				
27	e i	3	44	(0)			
			56	30			
30		3	10				Tremors.
Nov. 1	e M	11	23	(0)			
			40				
5	e M	18	8	(0)			
			10				
13		5	0				Prolonged tremors.
13		16	0				Tremors.
16		9	33				" "
17	e M	9	34	42			
			36				
18	e M	9	34	48			
			35	12			
23		15	5				Slight tremors.
26		14	51				Tremors.
29	P S L M	1	51	0		13.5	
			53	30			
			54	0			
			55				
30	P S L M	3	33	36		12.9	
			36	0			
				40			
			38				
Dec. 3	P S L	6	23	(0)		12.9	
			25	24			
			26				

Date. 1958	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Dec. 4	P S SR1 L(?)	8	21(24)			60°0	
			29 36				
			33				
			39				
7	P S SR1 L M	16	35 40			88°1	
			46 25				
			52 0				
		17	4				
			12				
7		22	3				Tremors.
11	P S L	4	1 48			9°1	
			3 30				
			4 0				
11		6	7				Tremors.
11	P S M	10	21 30			18°1	
			24 48				
			25+				
11	P S Sg	12	42 0			3°4	
			39				
			54				
21	e i L M	6	23+				Very small.
			33 42				
			44				
			53				
23	e	18	27				Tremors.
24	P(?) S L M	6	36 18			36°1(?)	
			42 0				
			46				
			51				
25	P PR1 S i SR1 SR2 L M	2	18(12)			94°2	Very small.
			22 24				
			29 24				
			32 48				
			35 36				
			40 30				
			48				
			59				
27	e M	14	26 30				
			27 50				
27	i	20	2 55				Prolonged tremors: may be arti- ficial.



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Arapuni

Lat. $38^{\circ} 5' S$: Long. $175^{\circ} 39' E$. Height above M.S.L. = 212 ft.

Lithologic Foundation : Rhyolite tuffs (Pliocene), more than 300 ft. thick, probably on Mesozoic rock.

INSTRUMENT : Milne Seismograph, E-W component; undamped.

CONSTANTS : Pendulum period (1932 Nov.15th) = 22 sec. Magnification=5.6.

OBSERVER : District Engineer, Public Works Department, Arapuni.



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Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Dec.21		6	51			Prolonged tremors.	
24	S i L	6	45	40	35(?)		
			49				
			50				
25	PR1	2	23	0	90		
	S		30	54			
	PS		32	42			
	SR2		40	5			
	L		49	40			
	M1		55				
	M2	3	5				
	M3		11				

Tuai

Lat. $38^{\circ} 48' S$: Long. $177^{\circ} 8' E$. Height above M.S.L. = 960 ft.

Lithologic foundation : Gravels (Pleistocene) probably at least 100 ft. thick, on argillaceous sandstones and argillites (papas), of middle Tertiary age.

INSTRUMENT : Milne-Jaggur Seismograph.

OBSERVER : Resident Electrical Engineer, Tuai.

Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Oct.14	Pg Sg	11	55	(0) 8		0.6	
18	Pg Sg	16	46	(0) 8		0.6	
Dec.10	Sg	14	54	(0)			
16	Pg Sg	17	8	(0) 9		0.7	
21		8	43				Faint tremor.

New Plymouth

Lat. 39° 4' S : Long. 174° 4' E. Height above M.S.L. = 112 ft.

Lithologic foundation : Ash, agglomerate and lava at least 100 ft thick, on argillaceous sandstones and mudstones (Pliocene)

INSTRUMENT : Wood-Anderson Short-period Seismograph:magnetic damping.

OBSERVER : Mr.H.W.Todd, Warder, The Prison, New Plymouth.



Date. 1932	Phase.	G.M.T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Oct. 2		9	15			Tremors.	
4	P S	20	13 35 14 5		2.6		
5	P i S (?)	2	6 55 7 20 36		3.6(?)		
5	P S	9	10 0 17		1.5		
6		22	22			Confused tremors.	
11	P S	3	17 49 18 7		1.6		
13	P i S	22	39 17 50 57		3.5		
14	P S Sg	6	48 17 49 7 15		4.4		
14	P S	11	55 37 56 7		2.6		
16	Pg	13	6 28			Local shock. Faint record, subsequent phases unreadable.	
16	P S	14	59 30 15 0 51		7.2		
18		16	45			Confused shock: phases not clear	
30	P S	21	58 50 59 26		3.2		
Nov. 3	Pg Sg	21	25 55 26 10		1.1		
6		5	16			Tremors.	
6	P S	23	44(22) 39		1.5		
12	P S	1	47 59 48 9		1.75		
14	P S	7	38 39 55		1.4		
18	P S	13	59 24 40		1.4		
18	P S	14	1 13 28		1.3		

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Nov. 23	Pg Sg	3	50	0 11		0.8(?) P very small.	
26		3	45			Small local tremor.	
26	P S	14	50	0 36		3.2(?) P very small.	
Dec. 2	P S	22	37	20 44		2.1 Rather large amplitude.	
5		14	56			Confused tremors.	
10	Pg Sg	5	48	0 15		1.1(?) P very small.	
10	P Pg(?) S	14	53	(20) 30 44		2.1	
11		12	59			Small tremor.	
16	P Pg S Sg	17	8	54 9 8 24 36		2.6	
18		7	14			Prolonged slight tremors.	
20	P S	4	54	38 57		1.7	
21		8	7			Tremors.	
25	L	2	+			Distant shock.	
25	P S	19	3	(47) 4 15		2.5	



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Hastings

Lat. 39° 38' S : Long. 176° 53' E. Height above M.S.L. = 35 ft.

Lithologic foundation : Alluvial sands, silts and gravels (recent Pleistocene) at least 500 ft thick, probably on limestone and sandstone (early Pliocene).

INSTRUMENT : Milne-Jaggard Seismograph.

OBSERVER : Mr. Henry deDenne, 304 South Nelson Street, Hastings.

Date. 1932	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Oct. 2	Pg Sg	9	13	(0) 12		0.9 Possibly a double shock.	
6		22	23			Small tremors.	
19	P S i	16	47	(0) 14 22		1.2 Prolonged record: possibly a double shock.	
25		1	9			Tremor.	
26		1	14			Local shock: no phases.	

12 Takaka

Lat. 40° 51' S : Long. 172° 48' E. Height above M.S.L. = 25 ft.

Lithologic foundation : Alluvial gravels (Pleistocene).

INSTRUMENT

Imamura Strong Motion Seismograph: three components: oil damping.

CONSTANTS

Component	Free pendulum period	Damping ratio	Date of determination of damping	Magnification
N	10 sec.	16:1	1932 Nov. 19th.	2
E	10 "	9:1	" " "	2
Z	4 "	1.7:1	" " "	2

Note: Values for pendulum periods and magnification, as given by makers.

OBSERVER : Mr. W. J. Smith, Postmaster, Takaka.

Date. 1932	Phase.	G.M.T. h m s	Period sec.	Δ deg.	Remarks.
Oct. 4		20 13			Slight shock.
Dec. 21	i	10 12 56			Local shock: no phases visible.

Christchurch Magnetic Observatory

Lat. 45° 32' S : Long. 172° 37' E. Height above M.S.L. = 25 ft.

Lithologic foundation : Gravels.

INSTRUMENT : Wood-Anderson Short-period Seismograph.

OBSERVER : The Director, Magnetic Observatory, Christchurch.

Date. 1932	Phase.	G.M.T. h m s	Period sec.	Δ deg.	Remarks.
Oct. 4	P S	20 13 36 14 6		2.6	
5	P Pg S	2 6 35 47 56		1.8	
13	P S	22 39 9 24		1.3	
16	P S	15 0 21 2 9		9.6	
18	P(?) S	16 48 24 54		2.6(?)	P very faint.
30		22 0			Prolonged shock: no clear phases
Nov. 14	L	19 15			
15		8 0			Local shock.
Dec. 5		14 56			Prolonged local tremors.
10	S	14 55 2			
16	P(?) S(?)	17 10 27 11 32		5.7(?)	Phases not clear.
21	L	6 37			



Glenmuick

Lat. 43° 54' S : Long. 173° 7' E. Height above M.S.L. = 247 ft.

Lithologic foundation : Gravel, on Tertiary Cretaceous and early Mesozoic rock.

INSTRUMENT : Inverted pendulum.

OBSERVER : Mr. A. S. Westland.



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Date. 1933	Phase.	G. M. T.			Period sec.	Δ deg.	Remarks.
		h	m	s			
Oct. 4	P S	20	13	0 27		2.4	
5	P Pg(?) S	2	6	(6) 12 22		1.4	
13	P i	22	38	34 39 0			S or Sg.
16	e1 e2 e3	16	46	50 32 54			
20	e1 e2 e3	17	42	40 6 10			
Dec. 16	P Pg(?) S e Sg(?)	17	9	(17) 0 17 22 27		5	
25	e L	2	50	53			Prolonged movements.